QST

October 1953
40 Cents
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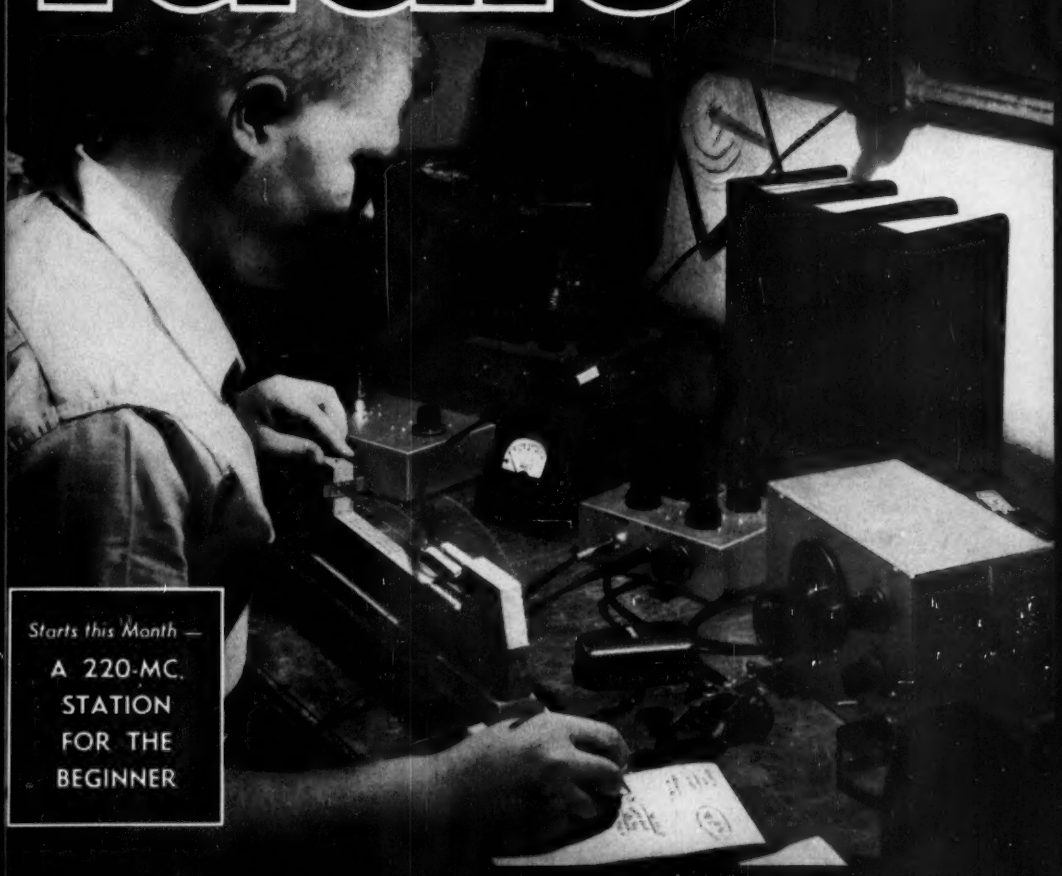
devoted entirely to

amateur radio



Starts this Month —
A 220-MC. STATION FOR THE BEGINNER

PUBLISHED BY THE AMERICAN RADIO RELAY LEAGUE

75 Years Old This Month, General Electric Has Written Tube History With a Long Series of "Firsts"!

1883—First electronic tube was built by Thomas A. Edison, a founder of G. E., in connection with his discovery of what was termed the "Edison effect."

1913—High-vacuum, high-voltage tube was developed, and work was begun on thoriated filaments.

1915—G-E tube research, toward modulating h-f for radio voice transmission, resulted in the design and construction of a successful phone transmitter operated from a-c.

1918—Quantity tube production. Over 100,000 radio vacuum tubes were built by G. E. for the U. S. Army and Navy.

1923—Superheterodyne circuit was announced. This remains the basis of modern radio reception.

1928—First special-purpose tube for loudspeaker operation was developed by G. E. (Type UX-120). Glow tubes were introduced for voltage regulation, and rectifier tubes made available for radio receivers.

1927—Screen-grid tube, for r-f amplification.

1942—Lighthouse tube, for radar and u-h-f communications.

1951—Ceramic u-h-f power-amplifier tubes were introduced commercially.

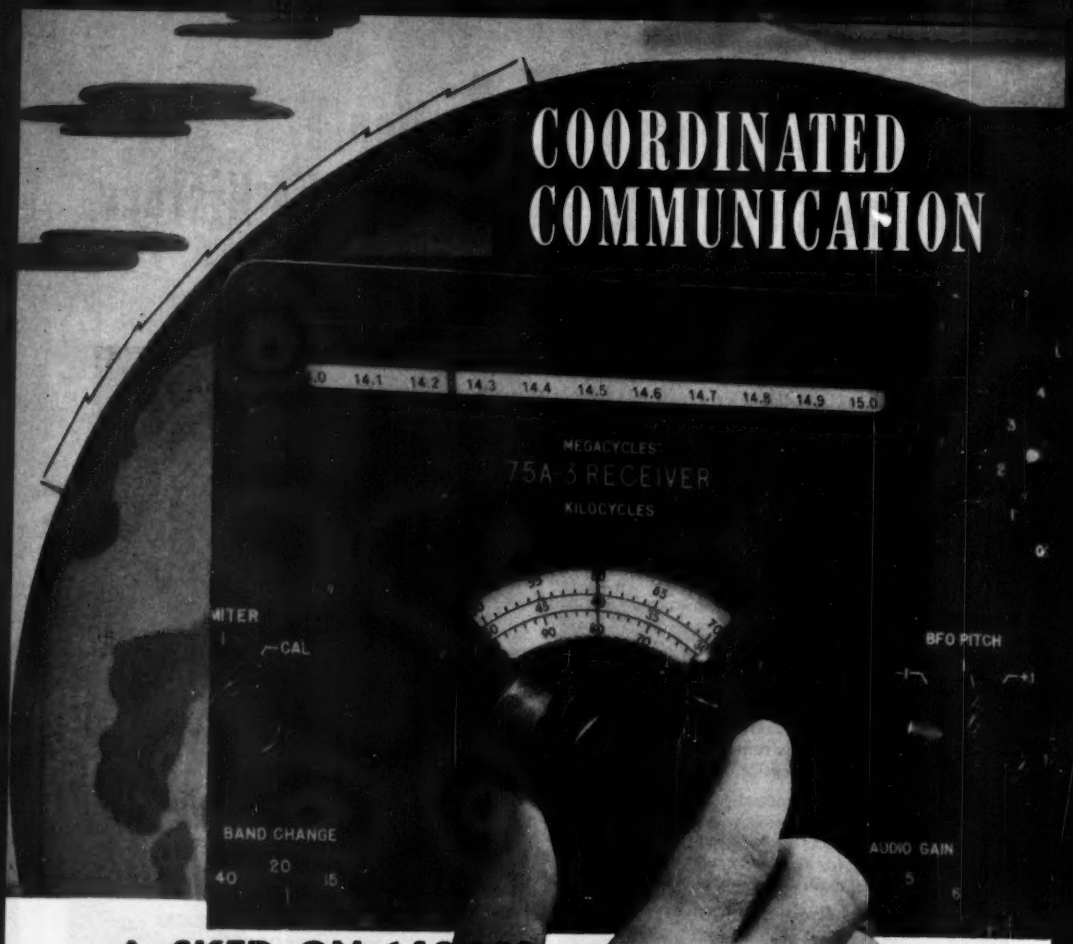
* * *

THESE and many other primary G-E developments—continued over the long history of ham radio—have helped build a unity of interests with amateurs. G. E. gratefully acknowledges the debt which the electronic industry owes to forward-thinking amateurs, and invites them to share in the dedication of G.E.'s 75th birthday to the promise of still greater progress to come.

1878 75 1953
YEARS OF ELECTRICAL PROGRESS
Diamond Anniversary

GENERAL ELECTRIC

186-1810



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A SKED ON 142.40? JUST SET THE DIAL AND YOU'RE THERE!

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On most bands you'll find each kilocycle is one dial division. And, for the perfectionist who wants to split kilocycles, the BR-1 100 kc crystal calibrator is available. It plugs into a socket on the chassis of your 75A-2 or 75A-3.

Let your distributor show you the accurate easy-to-read Collins dial and the stable permeability-tuned oscillator behind it. You'll find this feature on the 32V-3 and KW-1 transmitters as well as the 75A-2 and 75A-3 receivers.

For the best in amateur radio, it's . . .

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QST

OCTOBER 1953

VOLUME XXXVII • NUMBER 10

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OFFICES

38 La Salle Road
West Hartford 7, Connecticut

TEL.: 3-6268 TWX: HF 88

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INDEXED BY
INDUSTRIAL ARTS INDEX

—CONTENTS—

Check the specs...
Check the performance...

AND YOU'LL CHOOSE

Do you know any better way, any other way, to judge SW equipment than to check the specifications and the performance? Frankly that's the only valid way we can think of to make sure you get your money's worth. Check these specs. Take a look at the selectivity curve for the S-76. It is typical of the outstanding value Hallicrafters offers in every price class.

Model S-76

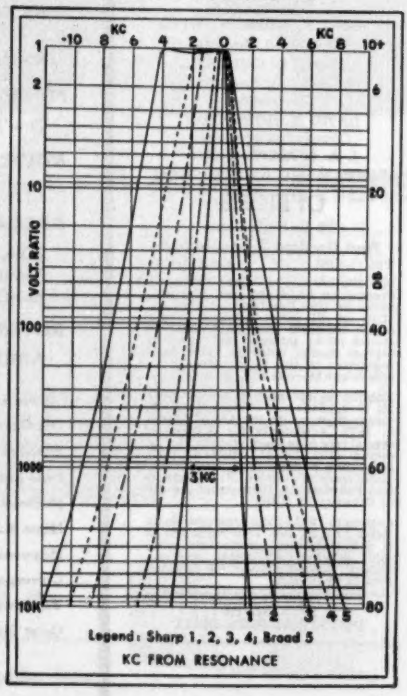
Double conversion receiver. Broadcast Band 538-1580 kc plus three short-wave bands covering 1720 kc-34 Mc.

Calibrated electrical bandspread for easy tuning. Double superhet with 50 kc second i-f and giant 4-inch "S" meter. Five position selectivity, one r-f, two conversion, two i-f stages, temperature compensated. 3.2 or 500 ohm outputs.

Satin black steel cabinet. 18½" x 8⅞" x 9½" deep. Nine tubes, plus voltage regulator and rectifier.

For 105/125V. 50/60 cycle AC
Use R-46 speaker $199.95

SELECTIVITY CURVES, S-76



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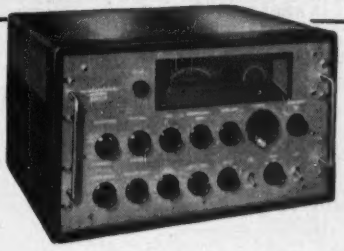


Model HT-20. T.V.I. suppressed 100 watt AM-CW transmitter with all spurious outputs above 40 Mc at least 90 db. below full rated output.

All stages metered; single meter with eight position meter switch; output tuning indication. Frequency range of 1.7 Mc to 31 Mc continuous on front panel control. Seven tubes plus five rectifiers.

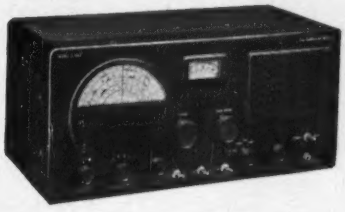
For 105/125 V. 50/60 cycle AC.....**$449.50**

Model SX-71. Covers Broadcast Band 535-1650 kc plus four short-wave bands covering 1650 kc-34 Mc and 46-56 Mc.

Built-in Narrow Band FM one r-f, two conversion, and three i-f stages. Temperature compensated, voltage regulated. Three watt output (terminals for 500 and 3.2 ohms).

Satin black steel cabinet. 18½" x 8⅞" x 12" deep. Eleven tubes plus regulator, rectifier.

For 105/125 V. 50/60 cycle AC....**$249.95**



Models S-40B, S-77A. Covers Broadcast Band 540-1680 kc plus three short-wave bands covering 1680 kc-44 Mc.

Electrical bandspread for easy tuning. One r-f, two i-f stages to draw in stations. Switches for automatic noise limiter, code reception and three-position tone control. CW pitch control and built-in speaker. Seven tubes plus rectifier.

S-40B For 105/125 V. 50/60 cycle AC **$129.95**

S-77A Same, for 105/125 V. AC/DC

32 lbs. **$129.95**

Model R-46. Matching 10" PM speaker for use with Hallicrafters communications receivers SX-71, SX-76, SX-73 or SX-62. 80 to 5000 cycle range. Matching transformer with 500-ohm input. Speaker voice coil impedance, 3.2 ohms.

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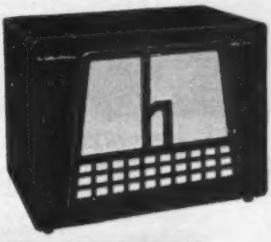

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Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **All ARRL Field Organization appointments** are now available to qualified League members. These include ORS, OES, OPS, OO and OBS. Also, where vacancies exist SCMs desire applications for SEC, EC, RM, and PAM. In addition to station and leadership appointments for Members, *all amateurs* in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

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"It Seems to Us..."

LET'S GET ROLLING ON 220!

If you qualify for the Old Timers Club, you probably recall — with not a little nostalgia, we'll bet — the fabulous 5-meter boom of the early '30s (for the benefit of today's hams we should mention that at that time our band was 56–60 Mc. instead of its present 50–54 Mc.). Those were the days! Self-excited transmitters and superregen receivers, built around a couple of receiving tubes; simple rigs anybody could throw together in a couple of evenings; getting out with the gang in the country or on the mountain tops every week end; duplex QSOs for ideal rag-chewing; local round-tables in the larger cities; working on a band where anything could happen, and often did. . . . Man, that 5-meter band was fun!

Like to sit in on something like that? Well, we have the chance. Turn back to the cover of this issue and have a second look at the 220-Mc. gear our lab technician, W1VLH, is working on; then turn to page 11 for the first of a series of articles on how to put it together. Here's a Hq.-designed v.h.f. station in the 5-meter man's tradition. It uses nothing but low-cost tubes and parts you can get anywhere. Only a single 300-volt power supply is needed for the whole outfit, and the drain is low enough to permit operation from a small 100-ma. vibrator supply, if you want to take it out to the hilltops.

During the past year, our mail has been full of requests from Technician licensees, and others interested in getting on v.h.f. quickly and simply, for something like this. Here it is: A 220-Mc. station you can build yourself, and without flattening the bankroll. If you're a beginner looking for a way to get started, or a comparative old-timer a little bored with that beautiful low-frequency job of yours, perhaps you'll want to take a fling at this kind of hamming.

You couldn't make the transmitter much simpler: It's a single tube oscillator — and before you get self-excited about *that*, we hasten to add that with today's highly effective tubes and components, it does a better job than did the 56-Mc. gear of 1933. The receiver includes a superregenerative detector; don't let memories of the early 5- and 2½-meter days' receiver radiation QRM scare you off — something new has been added. In a word, this is elementary gear you can live with. Operated with a little care, the transmitter is capable of radiating a signal that is copiable even on a selective receiver. The receiver, described in this issue, probably won't establish any world's records, but it will receive signals satisfactorily in terms of the whole outfit's capabilities. It does so without kicking up any superregen rumpus because it's a superhet, despite its having only two tubes. The modulator has provision for A2, in case you'd like to brush up on your code speed in addition to the use of voice for which the outfit is primarily designed.

When you want to progress on 220, as you probably will, provision has been made for advancement. A simple crystal-controlled transmitter r.f. section, to be used with the same power supply and modulator, will be a part of the series of articles. The receiver can be revamped to work as a converter, with resulting greatly improved performance, without discarding many of its parts.

What will it do? Well, the station worked over thirty miles of open terrain here in New England with an S9 report its first time on the air. The receiver has shown itself capable of hearing anything in the way of DX that the transmitter will cover. Altogether, the station is far ahead of the gear we used in the early days on "five." With today's improved antennas, we can do many things on 220 that were never dreamed of in the v.h.f. world of a generation ago.

With gear like this easily available, you'll be missing something if you skip 220 in the coming months. Let's get rolling!

GIVE THE NOVICE A BREAK

During the past year, we've spent about half our total operating time browsing around the Novice band. Sometimes we just listen, quite a bit of the time we operate. We've made a lot of new friends, supplied "firsts" (including a youngster in Florida who couldn't believe it) and "Connecticut" to a lot of new hams, and generally had ourselves a time. We've also been pleasantly surprised at the general operating savvy, the much-higher-than-expected code speed in many cases, and the surprising number of Novices who use break-in. All in all, it has been an enjoyable and educational

experience, apparently mutual to judge from comments over the air and on QSLs.

There's one aspect we want to register a protest about, however, and it hasn't anything to do with Novices. It's the extent to which a lot of Generals in W-land use that band for their QSOing with each other. Time after time we've gritted our teeth at hearing two Ws casually busting up a couple of channels with long-winded QSOs, or busting up one of our own with a Novice. We think this sort of thing is distinctly off the reservation. The rest of us have other parts of the band for QSOs with each other. Let's confine any QSOs in the Novice band to Novices.

OUR COVER

Two-twenty is in the limelight! See "It Seems to Us . . . ," p. 9, and "A 220-Mc. Station for the Beginner," p. 11.

HAMFEST CALENDAR

DISTRICT OF COLUMBIA — Sunday, October 4th, at Palisades Playground in northwest Washington, D. C. — the Washington Mobile Radio Club will sponsor a local hamfest. Activities will start at 2 P.M. featuring contests and plenty of entertainment. For further information write or call Dick Houston, W3MAX, 109 Seneca Drive, Washington 21, D. C., LOgan 7-7907.

KANSAS — Thursday, October 8th, at the Quivira Lake Country Club near Kansas City, Mo. — the Johnson County Radio Amateur Club is sponsoring a banquet-hamfest. There will be all the turkey, country style, that anyone may wish. Registration fee is $3. Contact W. L. Bennett, WØWMH, 4515 West 62nd St., Mission, Kans., for further info.

NEW YORK — Friday, October 9th, at Lost Battalion Hall, 93-29 Queens Boulevard, Elmhurst — the 17th Annual Hamfest and Dance of the Federation of Long Island Radio Clubs. Advance registrations are $2.00 to all, while tickets purchased at the door will be $2.50. Tickets may be obtained from Julian N. Jablin, W2QPQ, 147-14 Charter Road, Jamaica 35, N. Y.

Strays

Seven-year-old Sharon Pakinas, of Bothell, Washington, is undoubtedly the youngest YL amateur radio licensee. Sharon, who passed her Novice exam together with father Nick, starts third grade this fall. Sharon's kid brother Mike, only three, may be another fellow to keep an eye on! (*Seattle Post-Intelligencer photo*)

FEED-BACK

The reference to heater connections for the 12AU7 and 12AX7 in the photo caption on page 27 of August *QST* should read "Pins 4 and 5" instead of "Pins 3 and 4." Also, the 7-Mc. tap on L_1 should be placed at the 43rd turn from ground.

Some minor errors were printed in W2QZ's "Little Firecracker Linear" last month. Line 9, page 11, right-hand column, should read "B operation, the grid *voltage* also varies. . . ." In Fig. 1, the stator of C_{24} should be connected to the junction of C_{14} and L_5, to remove d.c. from the tuning condenser. The "+225" terminal in Fig. 2 should be marked "+250 reg.", and the panel size, given on page 14 as 8¾ by 17, should be 8¾ by 19 inches.

20th ARRL Sweepstakes — Nov. 14th–15th and 21st–22nd

How many different stations and how many of the 73 ARRL sections can you work in two week ends? If you are located anywhere in the League's field organization territory (see page 6), you are cordially invited to participate in this popular annual operating activity. Any amateur bands and either 'phone or c.w. may be used. In the competition for awards, 'phone entries are compared only with other 'phone entries and c.w. scores only with other c.w. scores in your particular section. The week-end periods starting Saturday afternoon (1500 PST or 1800 EST) on the 14th and 21st of November mark the open season for SS contacts.

A complete announcement of the contest, including the rules governing participation, will be carried in November *QST*. The rules will be the same as those of the 1952 SS, except in one particular: For the first time, certificates will be awarded to the highest-scoring Novice or Technician in each ARRL section from which *at least three* Novices and Technicians submit contest logs. Accordingly, it will now be possible for two certificates to be awarded in a given section: one to the over-all high scorer, as usual, and, where enough entries are received, one to the leading Novice or Technician.

Amateurs in remote ARRL sections who do not receive the November issue before the beginning of the Sweepstakes period may refer to November, 1952, *QST* for contest details.

Contest reporting forms will be sent to all amateurs who request them by mail or radiogram. It is not necessary to make advance entry or to use these forms, provided that the report form prescribed in November, 1952, or in the next issue of *QST* is followed.

A 220-Mc. Station for the Beginner

Equipment Designed Especially for the Technician Licensee

PART I — *The Receiver*

BY EDWARD P. TILTON,* W1HDQ, AND MASON P. SOUTHWORTH,** W1VLH

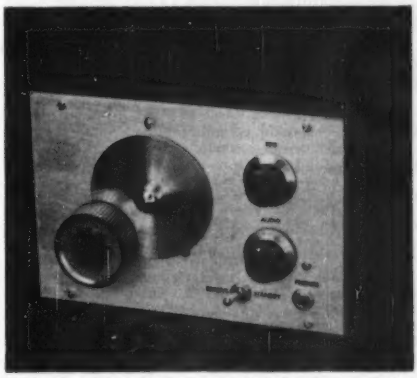
YEARS AGO, our v.h.f. bands were almost ideal beginners' territory. The equipment used was both simple and inexpensive, and while the operating range was generally rather limited, experimenting with circuits and antennas afforded the newcomer a fine opportunity to learn the practical fundamentals of the art. Large numbers of hams similarly engaged made it possible for him to have plenty of fun in the process.

It was not long, however, before advances in technique began to change all this. Where once a complete station might have used no more than two or three tubes and only the simplest basic circuitry, we moved into an era when it became necessary for a v.h.f. enthusiast to have a complex converter, a communications receiver, a crystal-controlled transmitter and a directional antenna system of some considerable size in order to hold his own. This worked wonders for our v.h.f. coverage, but it was rather hard on the newcomer with limited technical and financial resources.

Development of the 220-Mc. band proceeded slowly, therefore. It was not sufficiently different from 144 Mc. to attract many of the gang who had made such rapid strides in opening up that now well-populated territory. Most 144-Mc. pioneers who wanted to move on to new fields preferred the bigger jump to 420 Mc., where construction of effective equipment was more of a challenge, and where propagation characteristics were still more or less a question mark. Construction of multistage transmitters and receivers for 220 was beyond the capabilities of many beginners, so the band was left practically unoccupied, except for a few isolated areas where special efforts were made to organize activity.

Then came the Technician Class license, and with it both an opportunity and an obligation to develop 220. With it we have a chance to re-establish a popular beginners' band in the v.h.f. region. If we handle the initial phases of this development properly, the 220-Mc. band should provide plenty of room for both types of operation — the advanced-technique school, and the beginners who want to break into ham radio with equipment they built themselves. The former need no more than a megacycle; let them have 220 to 221 Mc. for their narrow-band techniques. That leaves four megacycles in which the growing army of Technicians, and other v.h.f.-minded newcomers, can employ gear of the kind we are about to describe.

These two groups need not be mutually exclusive. The receiver shown in this first installment will do a good job of receiving the crystal-controlled signals of the more advanced operators. The transmitter to be described in a subsequent article can be made to radiate a signal that is readable on a selective communications receiver, if it is adjusted and operated with care. The station is not the cheapest or simplest thing you could possibly build to get started on 220; rather, it is intended to be capable of giving its builder a good start in ham radio, at moderate cost and with a reasonable degree of technical simplicity. It is not as elaborate as the best, but with it you can make many interesting contacts, and you will have guaranteed yourself that greatest of all the thrills our hobby has to offer — that of making your first contact with equipment you built, in its entirety, yourself.



The receiver portion of the 220-Mc. station. Using only two dual-purpose tubes, it is complete in itself. No accessory equipment is needed, other than the power supply, which can be the one used for the transmitter.

What Kind of Receiver?

The 220-Mc. beginner can solve his receiver problem in several ways. If he has a communications receiver, he will probably want to build a converter to allow him to use the desirable features his receiver affords. Many converter designs have been described in *QST* and *The Radio Amateur's Handbook*, so this approach will not be discussed here, though it is highly recommended. The construction or purchase of a good communications receiver represents a considerable financial hurdle, however, so we decided on a simpler and less expensive alternative.

The simplest of all v.h.f. receivers is the super-regenerative detector, usually followed by one or more audio amplifier stages. As anyone who was

* V.H.F. Editor, *QST*.
** Laboratory Assistant, *QST*

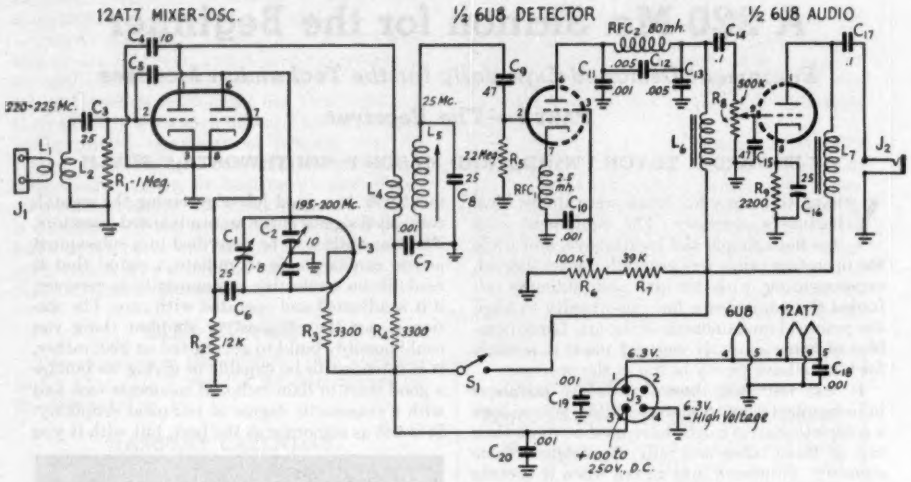


Fig. 1 — Schematic diagram and description of parts for the 220-Mc. receiver.

C_1 — 1-8 $\mu\mu$fd. plastic trimmer (Erie 532–10).
C_2 — 10-$\mu\mu$fd.-per-section split stator. (Bud LC-1660 with 2 rotor plates removed from each section; see text.)
C_3, C_6, C_8 — 25-$\mu\mu$fd. ceramic tubular.
C_4 — 10-$\mu\mu$fd. ceramic tubular.
C_5 — Coupling capacitor made from two 2-inch lengths of hook-up wire twisted together as required.
C_7, C_{10}, C_{11}, C_{18}, C_{19}, C_{20} — 0.001-μfd. disk-type ceramic.
C_9, C_{15} — 47-$\mu\mu$fd. ceramic tubular.
C_{12}, C_{13} — 0.005-μfd. disk-type ceramic.
C_{14}, C_{17} — 0.1-μfd. 400-volt paper.
C_{16} — 25-μfd. 50-volt electrolytic.
R_1 — 1 megohm, ½ watt.
R_2 — 12,000 ohms, ½ watt.
R_3 — 3300 ohms, 1 watt.
R_4 — 3300 ohms, ½ watt.
R_5 — 2.2 megohms, ½ watt.
R_6 — 0.1-megohm potentiometer.
R_7 — 39,000 ohms, 1 watt.
R_8 — 0.5-megohm potentiometer.
R_9 — 2200 ohms, ½ watt.
L_1 — 2 turns No. 18 enam., ¾-inch diam., inserted between turns of L_2.
L_2 — 2 turns No. 18 enam., ¾-inch diam., ¼ inch long.
L_3 — Copper loop, ½ inch thick, 1 inch wide, 1½ inches long. Slot is ¼ inch wide.
L_4 — 4 turns No. 22 enam. wound over cold end of L_5.
L_5 — 8 turns No. 22 enam., close-spaced on ¾-inch diam. slug-tuned form (National XR-91).
L_6, L_7 — Midget filter choke, broadcast replacement type (Stancor C-1708).
J_1 — Antenna terminal (Millen 33102 crystal socket).
J_2 — Open-circuit 'phone jack.
J_3 — 4-prong plug (Amphenol 86-CP4).
RFC_1 — 2.5-mh. r.f. choke (Millen 34101).
RFC_2 — 80-mh. r.f. choke (Millen 34280).

active in the heyday of the "rushbox" can tell you, this type of receiver could do quite a remarkable job, but it suffered from several fundamental weaknesses. It was noisy in the extreme, and very broad in its response to strong signals. It was tricky to adjust, and worst of all, it kicked up an awful rumpus for miles around, radiating a screeching interfering signal that was often almost as strong as that from the transmitter used in the same station!

Our receiver makes use of the desirable qualities of the superregen (high sensitivity, extreme simplicity, and inherent noise limiting and automatic volume control) while ironing out its more annoying features. It is made to serve as the second detector of a superheterodyne receiver. As such, it operates on a frequency around 25 Mc., where its radiation can be prevented from being a source of interference, and where it can be controlled more readily than at the signal frequency. Through the use of dual-purpose tubes we are able to perform all the essential functions of the superheterodyne with but two tubes, though it will be helpful in understanding the operation of the receiver if we consider it as having four.

How It Works

The first two stages are handled by a 12AT7 dual triode. Its first half is the *mixer* or first detector, its input circuit being tuned to the signal frequency by the coil L_2 and the grid-to-cathode capacitance of the tube. The other half of the 12AT7 is an *oscillator*. This is tuned by L_3 and C_2 across a frequency range that is about 25 Mc. lower than the signal frequency. Its output beats with the incoming signal in the mixer to produce a resultant signal on the *intermediate frequency*. This i.f. signal has the same characteristics as the original signal, except that it is lower in frequency, so it can be converted to an audible signal with a simple detector.

This is done in the first half of a 6U8, a tube that has a pentode and a triode in a single envelope. To make their functions clearer, the two sections are shown as separate tubes in the schematic diagram, Fig. 1. As may be seen, the triode portion operates as an *audio amplifier*. The plate circuit of the mixer, L_4, and the grid circuit of the detector, L_5, are tuned to the intermediate frequency. Keeping the cathode above ground for r.f., by means of the choke, RFC_1, makes the

tube oscillate, and the degree of superregeneration is controlled by the potentiometer, R_6, which varies the screen voltage.

The choke and condenser combination, RFC_2 and C_{11}, C_{12} and C_{13}, is a quench-frequency filter.[1] The audio choke, L_4, and the coupling condenser, C_{14}, apply the audio component of the detector output to the grid of the audio stage, where it is boosted to usable earphone or 'speaker level. Another choke-condenser coupling device in the detector plate circuit delivers the audio output to the 'phones or 'speaker, while preventing the appearance of the d.c. plate voltage across the output jack. Audio volume is regulated by the potentiometer, R_8. A stand-by switch, S_1, removes the detector and audio plate voltage to quiet the receiver during transmission periods.

Building the Receiver

The receiver is built inside a standard 6 × 9 × 5-inch aluminum utility cabinet (ICA 29844) to provide shielding against radiation of energy by the detector. The parts are mounted on a U-shaped chassis made from an 8 × 8-inch sheet of aluminum. Exact duplication of the original design is not important, but a layout drawing showing hole locations is provided so that the builder can duplicate it if he wishes.

Looking at the front-view photograph, we see the vernier dial (National type K) which drives the oscillator tuning condenser, C_2. It is suggested that a large knob (National type HRT) be substituted for the small knob supplied with the dial, as this makes for much smoother tuning. At the upper right is the regeneration control, and below it the volume control. Below this are the stand-by switch and the 'phone jack.

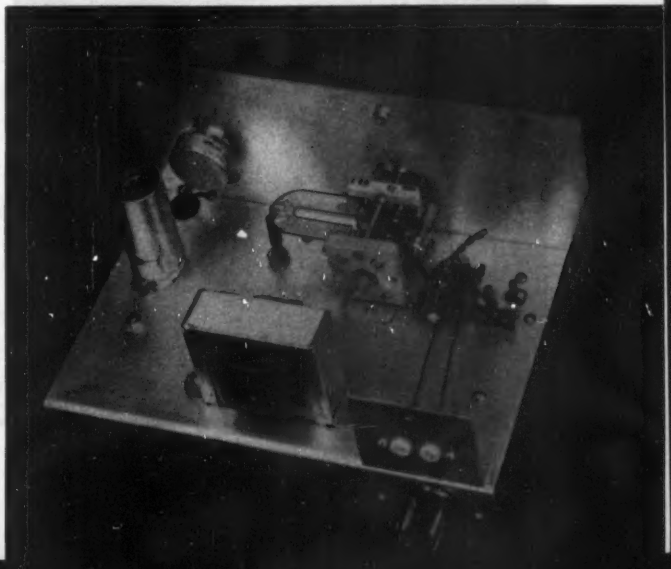
The top rear view shows the power connector, J_1, mounted on the rear wall of the chassis. Above it is the antenna terminal, a standard crystal socket, mounted on an aluminum bracket made from a 2 by 2½-inch piece with a half-inch lip bent over for fastening to the chassis. Clearance holes are made in the rear wall of the cabinet for these connectors, and the rear edge of the chassis is held rigid by three self-tapping screws through the back.

As seen in the photographs and the layout drawing, the 12AT7 socket is mounted in an inverted position near the power connector end of the chassis. (Right side in the top view.) It is positioned so that Pins 6 and 7 are toward the tuning condenser, and soldering lugs are placed under each mounting screw. The mixer grid coil, L_2, is supported at one end by a ground lug at the socket, and at the other by a tie-point terminal. The antenna coil is held between the turns of the grid coil, and by its leads to the antenna terminal. Heater and mixer plate leads go down through holes in the chassis near Pins 4 and 1, respectively. The slug adjustment for the detector grid coil, L_5, is visible between the socket and the edge of the chassis. Two twisted wires connected to Pins 2 and 6 provide oscillator injection coupling, and are shown on the diagram as C_5. The mixer plate by-pass, C_3, should be connected directly between Pins 1 and 3, with the shortest possible leads.

The tuning condenser, C_2, requires some revision in order to obtain full bandspread. Two rotor plates should be removed from each section, but it is suggested that they be left in until the

[1] For more on the operation of superregenerative detectors, see the chapter on v.h.f. receivers in any edition of *The Radio Amateur's Handbook*.

• For nearly two years now we've been receiving requests for "something simple and easy to build for 220 Mc." Seems there are lots of Technicians looking for ways to get started in ham radio. Here it is, gang — receiver, transmitter, modulator and accessories designed with the needs of the beginner in mind, and described in low-voltage language anyone can follow. See you on 220!



Top view of the 220-Mc. receiver, removed from its case. At the left is the 6U8 tube and the regeneration control. The U-shaped oscillator inductance is at the center, its ends soldered to the stator bars of the tuning condenser. At the right may be seen the inverted socket of the 12AT7 mixer-oscillator tube.

receiver is completed and working, as the greater tuning range the extra plates afford may make it easier to find the band. The bandset condenser, C_1, mounted between the stators of C_2, is one of the new tubular plastic trimmers. Ceramic or air-dielectric units may be substituted, but do not use a mica trimmer.

The oscillator inductance, L_3, must be mounted rigidly. This is done by soldering the ends to the stator bars and supporting the curved end on the resistor, R_3, which connects to the B-plus feed-through insulator, a National TPB. The inductance is made from a piece of flashing copper, 1½ by 1 inch in size. The U is ⅜ inch wide all the way around, making the center slot ¼ inch wide. The regeneration control can be seen in front of the 6U8 with its leads going through a grommetted holed in the chassis. The output coupling choke is near the back.

In the bottom view, the detector grid coil, L_5, appears on the left end of the chassis next to the 12AT7. When the specified coil form is used, the ends of L_5 are held in place by passing them through the small holes in the plastic rings supplied. If the rings are cemented onto the coil form about ½ inch apart before the coil is wound, sufficient space will be provided. The mixer plate coil, L_4, is wound over the ground end of L_5 in the same direction. Two extra holes in the rings may be used to hold L_4 in place. The tie-strip near the coil provides support for by-pass condenser C_7. Two more of these tie-strips, which are a great aid in supporting small parts, are visible near the center of the front edge. Dropping resistors R_4 and R_7 are mounted on them. Near the rear of the chassis is the coupling choke, L_6, between the detector and audio stage.

The small components for the detector and audio circuits are grouped near the right end of the chassis. These can be identified with the aid of the layout drawing. The 6U8 socket is mounted with the heater terminals, 4 and 5, toward the rear of the chassis. Soldering lugs for grounding are placed under each screw when the socket is mounted. RFC_1 is mounted directly behind the socket. This type choke is grounded at one end by its mounting screw. RFC_2 is to the left rear of the socket. The panel and chassis should be fastened together before the wiring is done as the regeneration control, stand-by switch, and 'phone jack are mounted only on the panel. The chassis is held on by the volume control and dial bearing as well as by 3 screws. The leads from the regeneration control are brought down below the chassis through a small grommet. By-pass condensers C_{19} and C_{20}, mounted right at the power plug, prevent radiation by the supply leads.

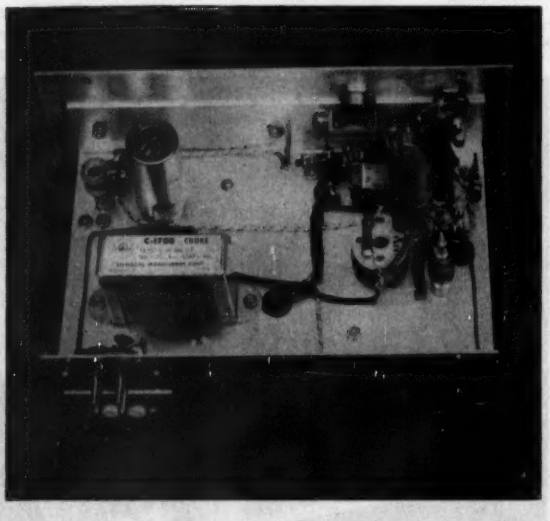
Wiring may be done with insulated wire of the push-back variety. Bare leads on the small parts should be covered with spaghetti where it is needed. Probably the easiest and neatest system is to put in the heater and power leads first, laying them around the edges of the chassis. Then wire in the small parts which are held by their leads.

All the parts listed are standard and should be readily available. With the mentioned exceptions, however, the exact types are not critical and substitutions may be made.

Adjustment and Operation

Before attempting to operate the receiver it is advisable to check through the wiring to see that no mistakes have been made and nothing omitted. Any power supply delivering 90 to 250 volts d.c. and 6.3 volts a.c. may be used for testing the receiver. The receiver also works well on d.c. and a 6-volt storage battery and 90 volts or more of "B" batteries may be used.

Apply the heater voltage, 6.3 volts a.c. or d.c., first, making sure that the tubes light up. A grid-dip meter is handy though not essential from here on, as it allows the resonant frequencies of



Looking at the bottom of the 220-Mc. receiver, we see the 12AT7 tube at the left. In the upper right corner are the components associated with the superregenerative second detector and audio circuits. Parts appearing in this view can be identified with the aid of the layout drawing, Fig. 2.

the various coils to be checked before the power is turned on. The mixer grid circuit should resonate at about 220 Mc., the oscillator should cover the range from 195 to 200 Mc., and the detector grid coil should be set to about 25 Mc.

It is helpful in getting a receiver like this going to start in at the back end and work forward. If the mixer and oscillator dropping resistors are disconnected at one end it will be easier to tell if the detector and audio stage are working properly. With the volume turned up about half way, advance the regeneration control. You should hear a rushing sound in the 'phones if the detector is working properly. It should go into superregeneration smoothly and not with a plop. If an absorption wavemeter is available in place of a grid-dip meter, it will cause a change in the rushing sound when coupled to the grid coil and tuned to the i.f. frequency. The detector frequency may also be checked by listening for its radiation in a calibrated receiver. No trouble should be experienced if the wiring is correct.

Next reconnect R_3. The operation of the oscillator may be checked in several ways. If a milliammeter is connected in series with R_3 the current should vary when L_3 is touched with a metal object if the tube is oscillating. The bandset condenser, C_1, should be turned in at least halfway for smooth operation of the oscillator. The frequency may be checked with an absorption wavemeter, a grid-dip meter or with the Lecher wire device to be described later. If it is not possible to make the oscillator hit exactly the specified range with the bandset condenser, the intermediate frequency may be changed slightly. The exact i.f. used does not matter, so long as it is equal to the difference between the signal and oscillator frequencies. It can be almost any frequency from 15 Mc. to as high as 50 Mc. if L_4 and L_5 are modified to take care of the change.

Connecting R_4 will put the mixer into operation. If this stops the superregeneration it will be necessary to remove one turn from L_4 to reduce loading on the detector. The size of the mixer grid coil and the twisted-wire injection condenser adjustments are not critical, and signals can be heard even if these are not set exactly right. In fact, it may be possible to dispense with C_5 altogether. If erratic tuning or evidence of oscillation shows up as the receiver is tuned across the band, reduce the coupling capacitance by untwisting the wires slightly.

That's about all there is to it, and you are now ready to make the final bandsetting adjustment. With all the plates still in the main tuning condenser there will be about 7 divisions spread on the dial for each megacycle. Modifying the condenser as suggested will change this to about 15 divisions per megacycle, though this will vary

(*Continued on page 110*)

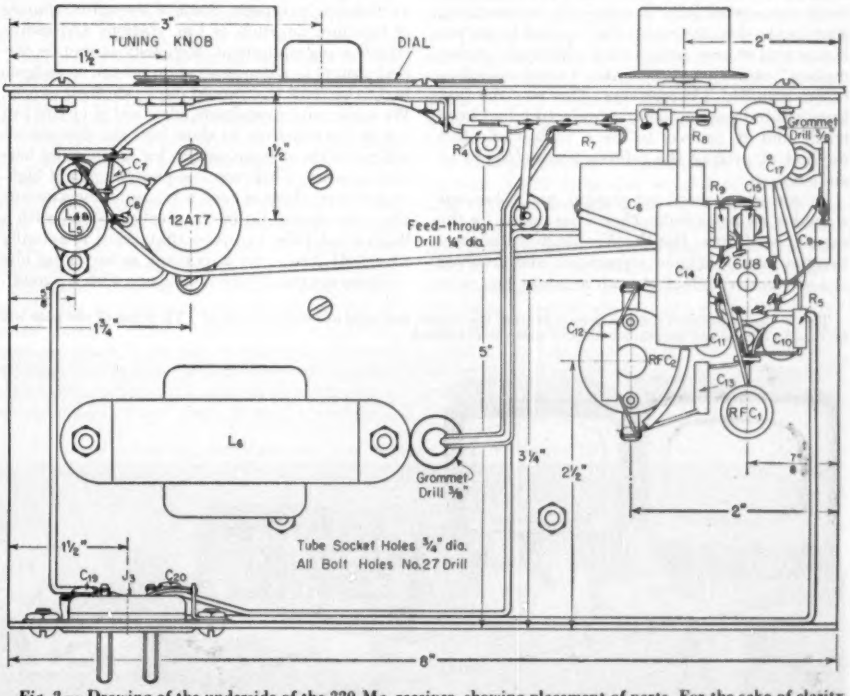


Fig. 2 — Drawing of the underside of the 220-Mc. receiver, showing placement of parts. For the sake of clarity, the stand-by switch and 'phone jack are omitted. Exact duplication of the layout is not important, but principal dimensions are given so that the constructor can copy the original if he so desires.

ARRL TVI Demonstration Completes Its First Tour

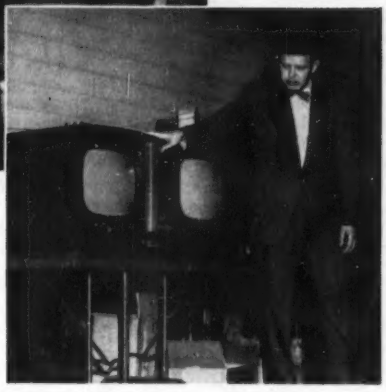
THE ARRL TVI Demonstration has just returned from its first "barnstorming" trip via station wagon, and by the time this issue of *QST* reaches you it will be on the point of embarking on its second swing around the country. By the end of this year, amateurs within the service-area range of most of the low-band v.h.f. TV stations east of the Rockies will have had an opportunity to see it and hear the lecture that goes along with it. The highly favorable comments of those who have seen it so far amply confirm that it has been a worth-while undertaking.

The trek just finished — it covered the cities listed in the announcement on page 50 of June *QST* — represented the materialization of a plan that began developing a year or more ago. Its beginnings were in a TVI clinic jointly sponsored by the Washington TVI Committee, RTMA Service Committee, and the Electric Institute of Washington, for which Phil Rand had been asked to lecture on the causes and cures of TVI. Although attendance was confined to service technicians and representatives of the service departments of TV receiver manufacturers, Washington hams coöperated fully in supplying transmitting gear for the demonstration Phil wanted to put on. Hams and others contributed electrical "noise-makers" of various types, and several manufacturers supplied TV receivers. This was the first time a full-dress demonstration-lecture had been tried, and it proved to be a highly effective method of getting the information across to an audience.

Of course the word got around, and there was a flood of requests from other cities asking for the same type of show. But the Washington affair had taken a lot of advance preparation and involved the coöperative effort of both amateur and non-amateur organizations. You can't just pick up any old TV receiver at the last minute and hope that it will have both the good and bad points you want to demonstrate. Nor can you hope that there will be some kindly old doctor just around the corner with a diathermy machine that radiates, or an f.m. station on the right frequency to give spurious beats. In fact, you can't even expect that the local ham group will have on tap both "good" and "bad" transmitters on which you can demonstrate such things as low-pass filters, all set up ready and waiting when the time comes to start the talk. To get uniform results in different cities there has to be a whole set of coördinated gear that can be transported to the spot and set up with the assurance that the particular effect under discussion at any time will be the one that actually shows up in the demonstration.

So we went to work on it. It took several months, but in the end we had just about what we wanted: A set of equipment that would show practically all of the common types of interference, from auto ignition to diathermy, from radiating receivers to ham harmonics, from front-end overloading to images. Some of the actual sources of interference, such as f.m. stations and industrial heating equipment, obviously cannot be carried around in a demonstration set-up, so gadgets had to be built that would duplicate their effects. We have two transmitters, identical in circuit but not in construction, to show how the now-standard methods of construction for minimizing harmonics work. There are low-pass filters and high-pass filters; there is even a transmitting antenna that gets strung up in the meeting room, with a fluorescent tube to prove that there is actually r.f. in it! And — as important as anything else — there are two TV receivers, one with a "good"

This is the equipment used in demonstrating the causes and cure of various types of TVI. Some of the gear will be readily recognized by readers of *QST* and the *Handbook*.



Lewis G. McCoy, W1ICP, of the ARRL Technical Staff, unloading the equipment at journey's end. (*Below*) On the speaker's platform at the Detroit, Mich., meeting.

front end and used without modification, the second with its circuits doctored so that it shows most of the spurious effects that can arise in a TV receiver. These were loaned especially for the purpose by the RCA Service Company, an organization that has shown a keen and coöperative interest in the project from the very start.

By the time the set-up was complete a meeting had been scheduled at Cambridge at the request of the Boston IRE section. This was close at hand, so the gear was piled into a car and hauled there for its initial tryout. It worked as we had hoped, so that was that. During the subsequent winter similar shows were put on in Baltimore, Washington, Pittsburgh, Chicago, and Grand Rapids, the equipment being shipped by rail in special packing boxes. All the time we were thinking — wouldn't it be nice if we could dispense with the time-consuming back-and-forth shipping and send the whole works out on a real tour in a station wagon of our own? It would, certainly.

At the first few shows Phil Rand did the talking, but we all realized that any extensive speaking tour on his part would be out of the question because of the excessive demands on his time. The only practical solution would be to have a member of the Headquarters staff take over, and this job was assigned to Lew McCoy, W1ICP. Besides being intimately concerned with TVI work at Headquarters, Mac had worked on the demonstration gear from the beginning and not only had participated actively at all of the meetings at which it was used, but had put on the show himself at Chicago. So in early June he took off West, covering the central part of the country on a trip that did not get him back to West Hartford until the end of July. He'll be starting out again in early October, and if you live in the southeastern part of the country you'll probably be seeing him.

A final word about the purpose of this demonstration. You'll remember we said at the beginning that the first one was purely for the education of service men. It is still true that this is the principal objective. The meetings do not accomplish as much good for ham radio as they might if the local groups — usually amateur clubs — do not make a special effort to get good attendance from the service and TV retailing people in the vicinity. The talk is pointed largely toward showing set dealers and service men how to recognize interferences that can be, and should be, cured at

(*Continued on page 118*)

The July heat didn't prevent a good turnout at this meeting at Indianapolis, Ind.

Simplified Voice Control with a Loudspeaker

BY WALTER N. HUNTER,* W6IBR

HERE is a useful gadget for the single-sideband operator who likes voice-controlled break-in but doesn't care for a headset. The idea is not new, since a similar circuit was described a few years ago.[1] However, this newer circuit is a simplification that eliminates two transformers and a tube from the original design. Hank Turkel uses the Nowak circuit at W6LZE and has tried this newer modification. He reports that the performances are comparable.

Referring to the circuit diagram in Fig. 1, the 6SN7 is a two-channel amplifier. The top channel is connected to the transmitter speech amplifier, ahead of the audio gain control. The lower channel is connected to some point in the receiver audio system — a handy point might be the 500-ohm output, if the receiver has one. The 6H6 rectifier rectifies the audio signals in the two channels. When a signal comes only from the speech amplifier, the voltage at the grid of the 6SL7 goes negative, cutting off the tube and causing the relay to "fall out." Signal coming from the receiver tends to bias the 6SL7 grid positive — signals coming through both channels can be made to have little or no net effect by adjustment of R_1 and R_2. A signal from the speech amplifier only, as when the operator speaks into the microphone, will cause the relay to drop out and turn on the transmitter. The "hold-in" time can be modified by changing the value of C_6 — a larger value of capacitance will give a longer hold-in.

It will be noted that the components specified are different for each channel. This is because the writer's speech amplifier has shaped frequency response and capacitors C_3 and C_5 tend to shape the lower-channel response in a like manner.

W6LZE has suggested that the only control needed on the front panel is R_8, which is used to balance for different operators. His experience has been that, once adjusted, R_1 and R_2 will need no further attention, and I have also found this to be the case.

To put the unit in operation, first adjust R_8 to the point where the relay is held closed with a positive action. While speaking into the microphone, R_1 is now adjusted until the relay operates with negligible lag. Now turn on the station receiver (placing the microphone at its normal location) and adjust the receiver audio for a fairly high level. The relay will now probably be tripped by the receiver output. Adjust R_2 to just eliminate this effect.

One word of caution. If your receiver gives a loud "pop" when the relay operates, it will feed through the 6SN7 receiver amplifier and may pull the relay in again. The answer to this is to use a receiver silencing system that will operate without the click. It was done at W6IBR by lifting the output ground connection on the receiver and running it to ground through a set of relay points.

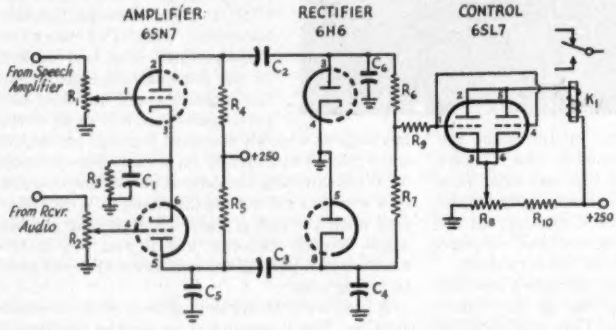


Fig. 1 — Circuit diagram of the voice-operated control circuit for use with a loudspeaker.

C_1 — 25-μfd. 25-volt electrolytic.
C_2, C_6 — 0.1-μfd. paper.
C_3, C_4 — 0.05-μfd. paper.
C_5 — 0.01-μfd. paper.
R_1 — 0.5-megohm volume control.
R_2 — 50,000-ohm volume control.
R_3 — 470 ohms.
R_4, R_5 — 0.1 megohm.
R_6, R_7 — 0.47 megohm.
R_8 — 500-ohm 4-watt wire-wound potentiometer.
R_9 — 1 megohm.
R_{10} — 10,000 ohms, 10 watts.
K_1 — 10,000-ohm sensitive relay.

We regret to inform our readers that since preparation of this article, word has been received of the untimely death of Captain Hunter as a result of a plane crash at sea.

* Captain, USAF.

[1] Nowak, "Voice-Controlled Break-In . . . and a Loudspeaker," *QST*, May, 1951.

Automatic 'Scope Monitoring of Transmission and Reception

Modulation Checks Without Switching

• Probably a lot of amateur-owned oscilloscopes are getting dusty — and maybe lazy — because they aren't kept as busy as they could be. One reason is that it's something of a chore to connect them up to receiver, transmitter, or whatnot, and even more of a nuisance to shift from one to the other. The circuits described here avoid switching and will keep your 'scope usefully busy every minute of your operating periods. They were developed by Earl I. Anderson, W2UE.

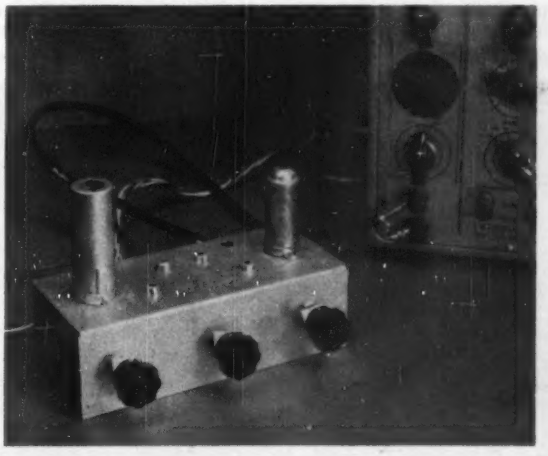
THE oscilloscope has become a fairly commonplace adjunct to 'phone transmitter operation and has been used, although probably a good deal less frequently, for making modulation checks on incoming signals. Either way, a certain amount of interconnection is necessary and, generally, a good deal of dismantling and rewiring must be done before the 'scope can be shifted from transmitter to receiver. It would be a great deal more convenient and would utilize the investment in the 'scope to a much more satisfying extent if the instrument could be used for both types of checking by some automatic form of changeover.

Such a changeover system is in fact not difficult to make, nor is it expensive. The circuits and equipment shown here offer alternatives depending on the type of 'scope available. To use either one, a simple modification in the receiver is all that is required — there is no connection at all to the transmitter. The system uses a small amount of i.f. output from the receiver for checking received signals, and includes a broad-tuning converter circuit for picking up the transmitted signal and changing it to the same intermediate frequency. The receiver and transmitter outputs are fed to the 'scope in parallel so that whichever one is present produces the pattern. When your transmitter is on, you see your own modulation; when the transmitter is off and your receiver comes on, you see the incoming signal — without any switching other than that normally used for changing from send to receive.

The Receiver Connection

Fig. 1 shows a suitable circuit for i.f. take-off from the receiver. The capacitive divider can be permanently installed near the last i.f. amplifier and the output lead run to a jack mounted at some convenient point on the receiver chassis wall. The divider adds approximately 10 $\mu\mu$fd. across the i.f. transformer to which it is connected, but this can easily be compensated for by retuning the affected circuit. The output can be taken through a shielded cable to the converter; whether or not a load is connected to the i.f. output terminals is of little consequence so far as the receiver's i.f. alignment is concerned since the maximum capacitance variation possible, from open circuit to short circuit, is only about 1 $\mu\mu$fd. (Incidentally, the same arrangement can be used to feed a Q5-er or any of the other outrigger i.f. attachments that are frequently used with receivers.)

More i.f. voltage will be obtained when the divider shown in Fig. 1 is connected to the plate of the last i.f. tube than when it is tied to the



The two-tube converter unit. Any convenient chassis size may be used; this one is home fabricated and is approximately 7 inches wide, 3 inches deep and 2 inches high. This unit gets its operating voltages from the power supply in the 'scope. The plate current drain is about 30 ma. and the filament current 0.45 amp.

grid. However, it has been observed that with some receivers the modulated waveform at the last i.f. plate is distorted rather badly; the effect has not been investigated closely enough to determine the exact cause, but some form or another

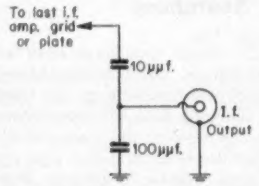


Fig. 1 — I.f. take-off circuit for installation in receiver. The capacitive voltage divider should be installed close to the i.f. circuit, but the lead to the output jack can be any convenient length if run in shielded wire.

of the principal troubles mentioned at the end of this article probably is responsible. If the 'scope pattern on a received signal does not meet the test for linearity outlined later, try connecting the divider to the i.f. amplifier grid.

If you own a 'scope having a "wide-band" vertical amplifier — meaning, in this case, one that will give appreciable amplification at the intermediate frequency of your receiver — you've done everything necessary for looking at incoming signals once you've installed the capacitive divider in the receiver. Simply connect the i.f. output to the vertical input terminals of the 'scope and you're in business. You can, in fact, check the modulation of your own transmitter with nothing more than this, provided the signal input to the receiver can be reduced enough to prevent overloading. This normally would require disconnecting the antenna and changing the gain control settings, which would be a nuisance except for an occasional check.

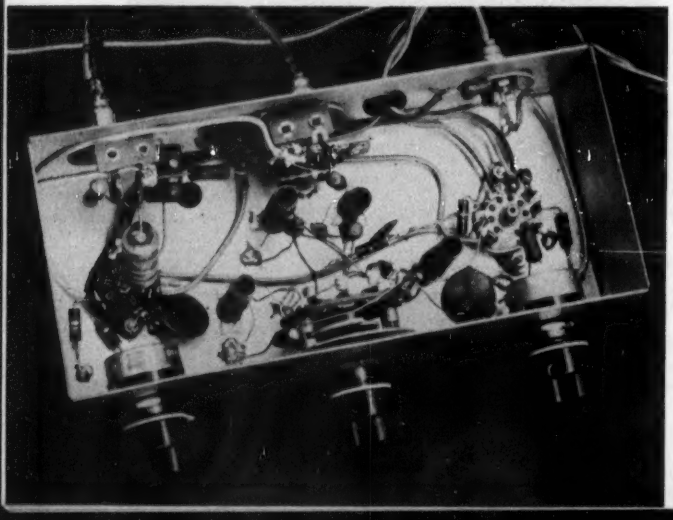
A Converter for "Wide-Band" 'Scopes

There are a good many 'scopes in ham stations these days that will qualify as "wide-band" instruments for the immediate purpose. The popular kit jobs, having been designed with TV servicing in mind, usually have vertical amplifiers capable of satisfactory operation through at least 500 kc., which is about the highest i.f. used in communications receivers. Even the older instruments will go up to 50 to 100 kc. quite well, so if your receiver — or Q5-er — has an i.f. in this region you should have little or no trouble even with a fairly ancient 'scope.

Assuming that you have a suitable 'scope, Fig. 2 is the circuit that will take care of continuous monitoring on both transmission and reception. A small amount of energy from the transmitted signal, picked up by a short length of wire connected to the antenna input terminal, is fed to the 6BA7 grid through a 500-ohm potentiometer used as an input control. The transmitted frequency is then converted to a low frequency, and the output from the 6BA7 plate circuit is fed to the 'scope input terminals. On the receiving side, a 6BJ6 is used as a means for coupling the receiver output to the 'scope in parallel with the 6BA7 output. The 2000-ohm resistor in its cathode serves as a gain control for the received signal.

The frequency of the converter oscillator circuit, L_1C_1, must differ from the transmitter frequency by some frequency within the range of the oscilloscope's vertical amplifier. With a 'scope having fairly flat response up to a few hundred kilocycles, this circuit will not require retuning within any of the amateur 'phone bands below 28 Mc. Taking a 200-kc. band such as 3.8–4 Mc. as an example, the oscillator frequency might be placed 300 kc. above the lowest operating frequency, or 300 + 3800 = 4100 kc. (The oscillator frequency should be placed far enough outside the band, obviously, to avoid interfering with reception.) Then a 3800-kc. signal will be converted to 300 kc., and as the signal frequency is raised the converted frequency will move downward, becoming 100 kc. with a transmitting frequency of 4 Mc. (4100 − 4000 = 100 kc.). With fairly flat 'scope response the pattern height will be the same throughout this range.

This variable i.f. feature requires that the output circuit of the 6BA7 converter be substantially flat over the required range. The output



Bottom view of the two-tube converter. The oscillator circuit uses slug-tuned inductances and ceramic fixed condensers. Ordinary layout and wiring practice can be followed. The principal precaution necessary is to provide some separation between the oscillator section and the 6BA7 output circuit to prevent coupling oscillator voltage into the output.

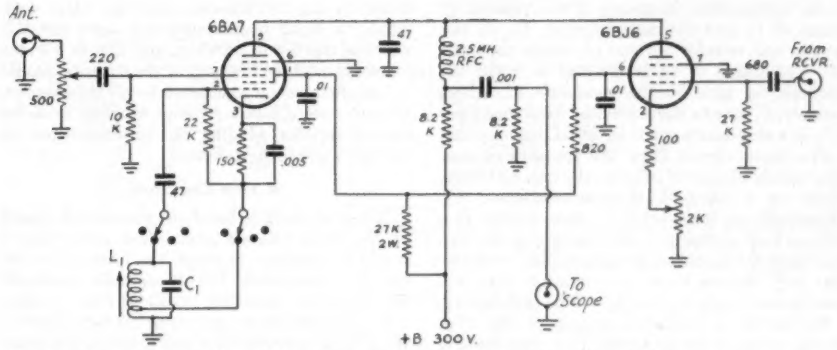


Fig. 2 — Converter circuit for applying either transmitted or received signals to oscilloscope. Capacity values below 0.001 μfd. are given in μμfd. All fixed resistors ½ watt unless otherwise noted.

The oscillator tuned circuit, L_1C_1, may be any *LC* combination that will tune to the desired frequency, as explained in the text. Representative values (either C_1 or L_1 should be adjustable) are

Band	L_1, *uh.*	C_1, *μμfd.*
3.5 Mc.	15.0	100
7 Mc.	4.5	100
14 Mc.	2.5	50
21 Mc.	2.0	25

circuit of Fig. 1 is a simple low-pass filter having a nominal cut-off frequency in the neighborhood of 500 kc., a figure chosen largely because it permitted a moderately high characteristic impedance (to keep the converter gain up) with a readily-available 2.5-mh. r.f. choke as the filter inductance. The input capacitance consists of the 47-μμfd. condenser in parallel with the output capacitances of the two tubes plus strays, and the filter output capacitance can be supplied by three or four feet of coax cable between the unit and the 'scope.

Aside from good response characteristics in the range below 500 kc., a second reason for using the filter is to prevent feed-through of converter oscillator voltage on the lower-frequency bands when an oscilloscope having good response into the megacycles is used. Although a simple broadly-tuned circuit centered in the i.f. range will suffice in this respect with many 'scopes, the filter proved to be a necessity to keep out feed-through on 3.5 and 7 Mc. when the unit was tried on a 'scope whose frequency response ran up beyond 5 Mc.

It is possible, of course, to substitute other types of tubes for those shown, provided appropriate electrode voltages are used. The 6BA7 is an excellent converter tube but is a bit touchy about oscillator feed-back. The tap on L_1 will run about 10 per cent (from the grounded end) of the total turns for optimum operation, rather than the 20 to 30 per cent commonly used in this type of circuit. Too much feed-back will drastically reduce the sensitivity of the 6BA7, and the rectified a.c. voltage between No. 1 grid and ground, as measured with a high-resistance voltmeter, should not be allowed to exceed −10 volts. Aside from this, values are relatively uncritical.

A Complete Oscilloscope Unit

Those who do not own oscilloscopes, or who have been using c.r. tubes without amplifiers for transmitter monitoring, will find the circuit of Fig. 3 applicable. This circuit provides the r.f. deflection voltages needed at the vertical plates, and is designed around a tube of the 2-inch variety. If you already have the tube, power supply, and divider string for supplying the various voltages needed, they can no doubt be used as is and only the r.f. section constructed.

This unit has a two-stage i.f. amplifier for working out of the receiver. Although 6SK7s are shown, any similar tubes could be used. The first stage is resistance coupled to the second, while the second stage output circuit is resonated

A complete 'scope unit, using a 2AP1 or other 2-inch c.r. tube. This one was built in the chassis and case of a discarded panoramic adapter unit. The layout is not critical. The i.f. amplifier is along the right-hand edge of the chassis in this view and the r.f. input circuit from the transmitter is at the upper left.

at the intermediate frequency of the receiver by means of L_1 and the mica trimmer, C_1. L_1 can be any coil suitable for the i.f. range provided the capacitance of C_1 is selected to make the combination tune to the receiver's i.f. Alternatively, C_1 may be the associated fixed condenser if L_1 is a slug-tuned coil from an i.f. transformer.

The input circuit from the transmitter consists merely of a set of coils for the various bands, tuned by a 100-$\mu\mu$fd. variable condenser, C_2. These coils are intended to be link coupled to a pick-up loop at the rig — in other words, the conventional arrangement for modulation monitoring. Any coil-condenser combination that will tune to the bands to be used will be satisfactory.

If desired, a converter circuit of the type shown in Fig. 2 can be substituted, thus making the unit completely independent of the transmitter. Since the selectivity of the i.f. output circuit of Fig. 3 may be sufficient to affect the pattern height appreciably as the transmitter frequency is moved through the band, C_1 in Fig. 2 should be a 100-$\mu\mu$fd. variable so the circuit can be tuned as required. The values given in Fig. 2 for L_1 are representative for a 455-kc. i.f. The converter output should be coupled to the input circuit of the i.f. amplifier so the gain of the latter will be utilized.

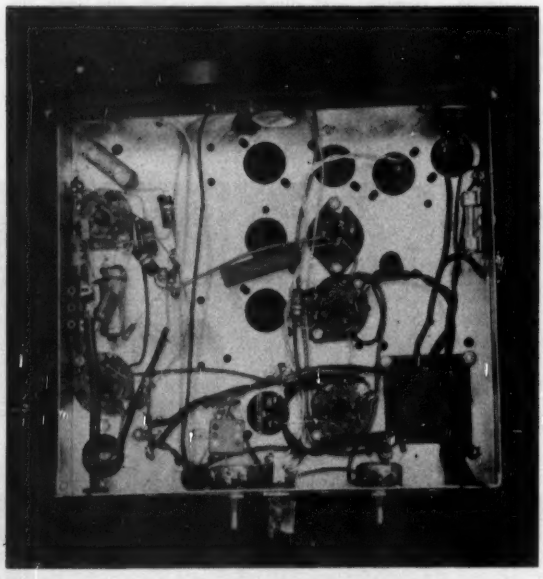
The power supply has a full-wave rectifier with an *RC* filter for furnishing plate voltage to the two i.f. tubes. The output of a half-wave rectifier operating from one side of the transformer secondary is added to the full-wave output to give a total voltage of about 700 for the c.r. tube. A.c. voltage from the same winding is used to supply a 60-cycle sweep for the horizontal plates.

The particular transformer used in this unit is one having two 6.3-volt windings. More commonly, a small transformer will have one 6.3-volt and one 5-volt winding, and if such a transformer is used the filament of the c.r. tube should be supplied from a separate 6.3-volt transformer. In such case a 5-volt rectifier working from the regular rectifier winding can be substituted for the full-wave 6X5, if desired.

A Few Cautions

Before starting to hand out unsolicited reports on the other fellow's modulation percentage it would be prudent to check the linearity of the system on reception. This is especially appropriate when the converter circuit of Fig. 2 is used with a 'scope whose operating characteristics in the i.f. region are not too well known. It is possible, for example, to overload the early stages of the oscilloscope's vertical amplifier before the desired pattern height is obtained (the probable reason being nonuniformity of frequency response in the various stages), which tends to clip one side of the pattern. This "one-sided" modulation pattern means only that there is trouble in the receiving display set-up and has nothing whatever to do with the quality of the incoming signal.

Another point to watch out for, when using a wide-band 'scope, is simultaneous i.f. and audio in the 'scope amplifier. Depending on the magnitude of the a.f. impedance, if any, in the circuit from which the i.f. voltage is taken, and whether rectification is possible in that circuit, a small audio voltage may be fed to the 'scope along with the i.f. signal. The combination gives some interesting patterns — but not of a kind that can be transmitted on a radio wave. These same effects will be observed if a stage in



The bottom-of-chassis layout was simply adapted to the existing chassis, showing that there is nothing "cranky" about the layout or wiring. The i.f. amplifier is at the left in this view. The vertical centering and width controls, which seldom need adjustment, are mounted on the rear wall of the chassis.

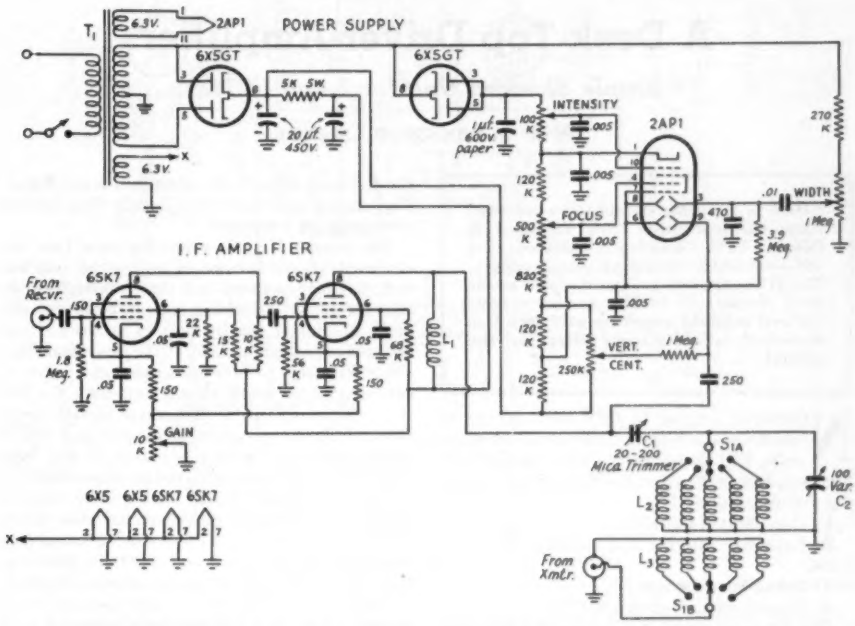


Fig. 3 — Complete 'scope circuit for transmitter-receiver monitoring. Capacity values below 0.001 μfd. are given in μμfd. Fixed resistors are ½ watt unless otherwise noted.

L_1 is approximately 1 mh. for an i.f. of 450–500 kc. Values for L_2 are of the same order as those given for L_1 under Fig. 2. L_3 is a link of a few turns wound on same form as L_2. T_1 is a small power transformer having approximately 300 volts each side c.t., 40 to 50 ma., with two 6.3-volt windings (such as Freed type RGP-3).

the 'scope vertical amplifier is overloaded and rectification occurs.

There is an easy way to check for defects of this nature. If the system is linear the deflection will be symmetrical about the horizontal axis. Thus every value of r.f. voltage will produce a vertical line that extends exactly as far below the horizontal axis as it extends above. In a modulated pattern, therefore, a vertical line through any part of the pattern should always intersect the pattern envelope at equal distances above and below the axis. If the pattern displayed on an incoming signal does not meet this test the trouble is in the set-up and not in the signal — it is physically impossible for the signal itself to be other than symmetrical about its axis.

Even when troubles of this nature are eliminated, the modulation percentage as displayed by the oscilloscope may differ from the actual percentage on the incoming signal because of receiver characteristics or because of the way the receiver is tuned. High selectivity will reduce the modulation percentage by cutting down the received sideband power, so a modulation check always should be made with the selectivity switch in the broadest position. The "straight-super" selectivity of most communications receivers is sufficiently broad to allow reproduction of the signal with all the accuracy necessary in practical work. However, it is fairly important that the i.f. alignment be in good order. Also, the signal should be tuned to the center of the i.f. pass-band[1]; tuning to one side will increase the apparent modulation percentage by bringing up the sideband amplitude while simultaneously reducing the carrier, a situation that is frequently exaggerated by the a.v.c. action of the receiver.

Finally, the signal as received may not be in the same shape as it was when it left the transmitter — selective fading will do horrible things to the modulation pattern — so it is rather unsafe to criticize the other fellow's modulation unless you're sure that transmission conditions are stable. But when reasonably optimum conditions exist, as they frequently do, you will no doubt find as others have before that the amateur 'phone transmitter that can go over 100 per cent modulation — or even up to 100 per cent — is a pretty rare bird. Splatter, yes; but at modulation percentages that, for the most part, run around 75 or 80 per cent. With either of the gimmicks described here, you can compare your own output with what you get from others. — *G. G.*

[1] Except with those receivers using narrow-band (3 kc., approximately) flat-topped i.f. systems deliberately designed to give single-sideband reception of an a.m. signal. The proper tuning condition here is with the carrier set at one edge of the passband. However, the fact that only one sideband is utilized by the receiver reduces the modulation percentage, as displayed by the oscilloscope, to half its actual value at the antenna input terminals of the receiver.

A Desk-Top Driver-Amplifier

Simple Shielded Unit for 7 and 14 Mc.

BY R. C. DENNISON,* W2HBE

• Here is a simple straightforward two-stage bandswitching unit designed to follow a VFO. Completely shielded, it is self-contained, including power supply. The 815 output stage operates as a push-push doubler at 14 Mc. and as a neutralized straight amplifier at 7 Mc. Also described is a low-pass filter for the output.

NUMEROUS articles in *QST* have described methods of shielding transmitters to eliminate TVI. Some of the systems outlined, however, have suffered one or more of the following disadvantages:

1) Complicated fabrication.
2) Extensive filtering and shielding of power leads.
3) Shielding of meters.
4) Unprofessional appearance.

The transmitter to be described overcomes these objections and yet is not expensive. If all components are purchased new, the cost will be about $70.00.

Commercial appearance is achieved by enclosing the transmitter in a cabinet of appealing proportions, by using a symmetrical arrangement of panel controls and by labeling these with decals. A homemade license holder on the front panel serves as a distinctive "trademark" and also balances the panel layout.

Circuit Features

The circuit diagram, shown in Fig. 1, reveals that the rig is not a complete transmitter but rather a two-stage amplifier. Since all of our operation is done with a VFO, the added cost of providing crystal control was not justifiable. If provisions for crystal control are desired, the coaxial VFO jack can be replaced with a crystal socket.

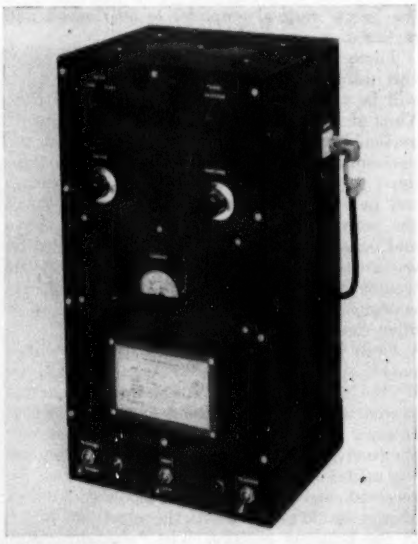
The first stage uses a 6AQ5 tube which operates as a buffer-driver since the output frequency of our VFO is 7 Mc. In the plate circuit, L_2 is closely coupled to L_3 and L_4. This eliminates the need for a plate tuning condenser and simplifies adjustment.

The final employs an 815 tube and is arranged to operate either as a push-push doubler when 14-Mc. output is desired, or as a self-neutralized amplifier when 7-Mc. operation is preferred. Bandswitching is accomplished by means of S_2, which shorts out part of L_5 for 14-Mc. operation and opens the filament circuit of one section of the 815 tube when 7-Mc. operation is employed. The unused section of the 815 tube then acts as a neutralizing condenser.

The meter, MA_1, is a moving-vane type instrument, chosen because of its low cost and the fact that it is mounted in a drawn metal case so that no auxiliary shielding is required. By means of S_1, the meter can be used to measure either the grid or cathode current of the final stage. Resistor R_3 serves to prevent a momentary loss of bias when S_1 is operated and to protect the 815 if S_1 should fail, or if the meter should open. Resistor R_4 has a resistance equal to that of the meter and thus prevents a change in grid bias when the meter is switched to the plate circuit.

The grid circuit of the final will be seen to comprise a balanced pi-section low-pass filter. This filter attenuates TVI-producing harmonics generated in the driver and VFO. In addition, C_9 and C_{10} materially aid in suppressing parasitic oscillations, the 815 being somewhat prone to misbehave in more conventional circuits.

A key click-filter consisting of L_1 and C_3 is built into the transmitter. The value of L_1 is not too critical and may be a small choke of the type used in a.c.-d.c. receivers, or the primary winding of an output transformer. The purpose of RFC_2



This small unit contains a two-stage driver-amplifier unit, designed to follow a VFO and covering 7 and 14 Mc. Power supply is included. Control switches and indicator lamps are at the bottom. The two tuning controls, and meter and band switches are above.

* % TV Terminal Equipment, RCA Victor Div., RCA, Camden 2, N. J.

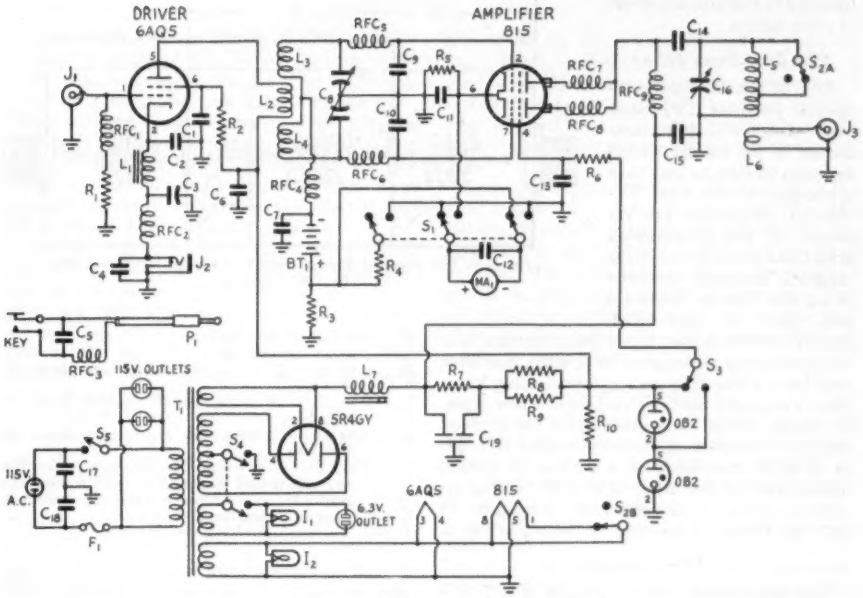


Fig. 1 — Circuit of the desk-type driver-amplifier.

C_1, C_2, C_4, C_6, C_7, C_{11}, C_{12}, C_{13}, C_{17}, C_{18} — 0.0047-μfd. 500-volt mica.
C_3 — 0.47-μfd. 200-volt paper.
C_5 — 470-μμfd. mica.
C_8 — 100-μμfd.-per-section variable (Hammarlund HFD-100).
C_9, C_{10} — 82-μμfd. ceramic.
C_{14}, C_{15} — 0.0047-μfd. 1000-volt mica.
C_{16} — 50-μμfd.-per-section (National TMK-50D).
C_{19} — Paper replacement for dual 8-μfd. electrolytic, 600-volt wkg. (Sprague DR-88).
R_1 — 47,000 ohms, ½ watt.
R_2 — 27,000 ohms, 1 watt.
R_3 — 22,000 ohms, ½ watt.
R_4 — 560 ohms, ½ watt.
R_5 — 27 ohms, 2 watts.
R_6 — 470 ohms, ½ watt.
R_7 — 500 ohms, 5 watts.
R_8, R_9 — 15,000 ohms, 10 watts.
R_{10} — 82,000 ohms, 2 watts.
L_1 — 3.5-hy. 50-ma. filter choke (Stancor C-1080).
L_2 — 17 turns No. 20, 1½-inch diam., close-wound (National XR-50 coil form).
L_3, L_4 — 5¾ turns No. 20, close-wound, spaced ⅛ inch from either side of L_2.
L_5 — 22 turns No. 14, 1½-inch diam., 1¾ inches long, tapped 8 turns from ground end (B & W 40 JEL modified — see text).
L_6 — 3 turns No. 14, 1⅞-inch diam., turns spaced wire diam. (part of B & W 40 JEL).
L_7 — 8.5-hy. 200-ma. filter choke (Stancor C-1721).
BT_1 — 45-volt B battery (RCA VS-055).
F_1 — Fuse.
I_1 — 6.3-volt pilot-light assembly (red jewel).
I_2 — 6.3-volt pilot-light assembly (green jewel).
J_1, J_3 — Coaxial jack (Amphenol SO-239).
J_2 — Closed-circuit jack.
MA_1 — 10-ma. d.c. milliammeter (Shurite).
P_1 — Two-conductor 'phone plug.
RFC_1, RFC_3, RFC_4 — 2.5-mh. r.f. choke (National R-100).
RFC_2 — 7-μh. r.f. choke (Ohmite Z-50).
RFC_5, RFC_6 — 15 turns No. 24, close-wound on 470-ohm 1-watt resistor.
RFC_7, RFC_8 — 11 turns No. 18, ⅝-inch diam., ¾ inch long.
RFC_9 — 1-mh. 300-ma. r.f. choke (National R-300S).
S_1 — 3-pole 2-position rotary switch (Mallory 3242J).
S_2 — 2-pole 2-position ceramic switch (Mallory 174C).
S_3 — S.p.d.t. toggle.
S_4 — D.p.s.t. toggle.
S_5 — S.p.s.t. toggle.
T_1 — Power transformer: 1200 volts c.t., 200 ma.; 5 volts, 3 amp.; 6.3 volts, 3 amp.; 6.3 volts, 3 amp. (Stancor PC8414).

and C_4 is to prevent radiation of harmonics by the keying line. Another filter, consisting of RFC_3 and C_5, is mounted directly on the key to prevent local key clicks caused by arcing at the key contacts.

The power supply delivers 450 volts to the final and 216 volts to the driver. Miniature voltage-regulator tubes are employed to prevent the amplifier screen voltage from rising under key-up conditions. A heavy bleeder could be used for this purpose, but would be wasteful of power. Using S_3, the amplifier screen voltage can be reduced to 108 volts during preliminary adjustments.

Two a.c. receptacles connected in parallel with the primary winding of the power transformer are provided so that the receiver and VFO may be turned on simultaneously with the transmitter filaments. The transmit switch, S_4, turns the high voltage on and also energizes a third a.c. receptacle which furnishes 6.3 volts to operate the antenna relay.

Fixed bias, from a small 45-volt battery, is applied to the grids of the final. While this method of biasing is more expensive than grid-leak bias, it allows the VFO to be keyed when break-in operation is desired; moreover, it pro-

tects the 815 tube in the event of drive failure.

The Low-Pass Filter

Any 51- or 72-ohm commercial low-pass TVI filter may be used with this transmitter. If the builder wishes to design his own, he may take advantage of the local TV-channel allocations. For example, in the Philadelphia area, Channels 3, 6, and 10 are assigned. The sixth harmonic of 14 Mc. falls in Channel 6 and must be attenuated. Since 14.35 Mc. is the highest frequency at which the transmitter is designed to operate, the filter may have a cut-off frequency considerably lower than is normally used in commercial filters. This, of course, yields more attenuation for a given number of sections. A two-section filter is in use at W2HBE consisting of a constant-*k* section having a cut-off frequency of 26.4 Mc. and an *m*-derived section with maximum attenuation at 84.3 Mc. Details of this filter are shown in Fig. 2.

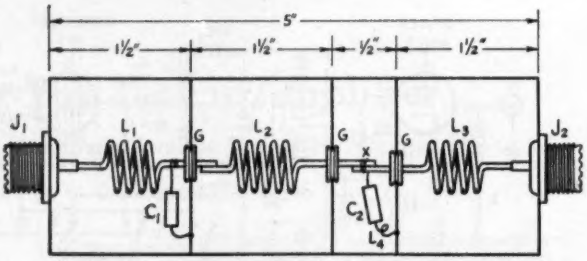


Fig. 2 — The low-pass filter is built in a copper box measuring 5 by 2 by 2 inches.

C_1 — 168-$\mu\mu$fd. silvered mica.
C_2 — 16-$\mu\mu$fd. silvered mica.
L_1 — 0.44 μh. — 7 turns No. 16, ½-inch diam., ½ inch long.
L_2 — 0.85 μh. — 10 turns No. 16, ½-inch diam., ½ inch long.
L_3 — 0.41 μh. — 7 turns No. 16, ½-inch diam., ½ inch long.
L_4 — 0.022 μh. (short point *X* to nearest point on box and adjust lead length of C_2 until it resonates at 84.3 Mc. as indicated by a grid-dip oscillator).
G — Rubber grommet, for ¼-inch hole.
J_1, J_2 — Coaxial jack (Amphenol SO-239).

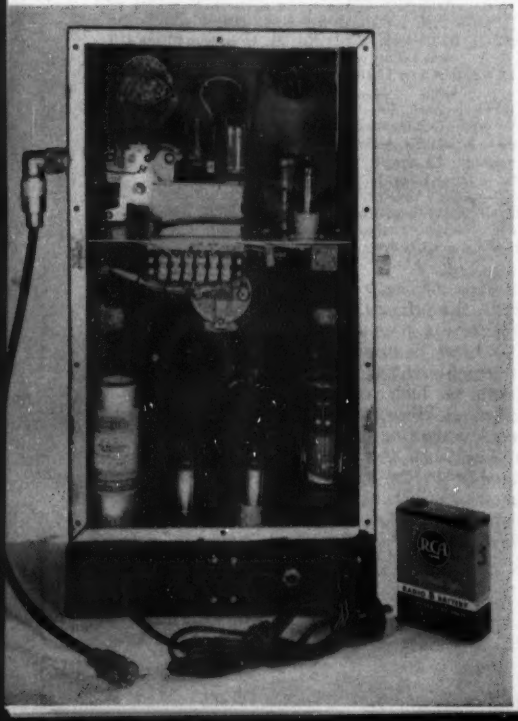
Construction

The transmitter cabinet consists of a 7 × 9 × 15-inch steel utility box mounted on top of a 7 × 9 × 2-inch steel chassis. These are held together by means of the power-supply components. The holes for these parts may be located as follows: Drill 1/16-inch pilot holes in the top of the subchassis at the centers of all holes required. Carefully center the subchassis against the bottom of the large box and drill through two of the pilot holes into the large box. The assistance of the XYL or a large C clamp will keep the parts aligned during this operation. Now the subchassis may be bolted to the box by passing screws through the holes just drilled, after which the remainder of the holes may be transferred to the large box. Now the screws should be removed and all of the holes drilled or punched to the correct sizes.

The r.f. section is mounted on a shelf of 1/16 inch aluminum measuring 6½ by 7¾ inches. This shelf has a ½-inch lip (not included in the above dimensions) which is bolted to the front panel of the utility box along a line 6⅜ inches from the top. The shelf is braced by two ½-inch wide struts of 1/16-inch aluminum.

Both tuning condensers are mounted on the shelf with the driver condenser requiring two shims of 1/16-inch aluminum to bring its shaft up to the same height as that of the final tank condenser. The condenser shafts are 5⅛ inches apart. The meter switch and the bandswitch are mounted 3¼ inches above the driver and final-condenser shafts, respectively. The meter is centered 8¾ inches down from the top of the transmitter.

The final tank coil is made from a B & W type 40-JEL plug-in coil. First, the ceramic base is removed by drilling out the rivets. The metal brackets should not be removed. Several turns of wire must be taken off the coil from the end



The completed two-band amplifier unit, with power supply installed. The low-pass filter described in the text is fastened to the back cover plate of the box and connected to the coax output cable.

opposite the link until a total of 22 turns remains. This can be done by snipping off the ends of the plastic supports as close to the wire as possible and then pulling the wire out of the supports. The standing end of this wire should be left long enough to reach to the right front solder lug on the front stator of the tank condenser. The tap should be soldered on at a point 8 turns from the link end. In order to facilitate this, the 7th and 9th turns are dented in about $\frac{3}{32}$ inch.

The tuning condenser is a National TMK-50D. If the metal brackets which held the B & W coil to its ceramic base are each turned 180 degrees, the rivet holes will be the right distance apart to line up with the threaded holes in the jack bar on top of the tuning condenser. This affords a very neat and rigid method of mounting the tank coil on the tuning condenser.

Ventilation is provided by two $2\frac{1}{4}$-inch holes in the top of the cabinet and a 5×6-inch hole near the bottom of the rear panel. These are covered with perforated sheet-metal plates containing 16 holes per inch. These screens must make good electrical contact with the box; furthermore, the front and back panels must also make good contact with the box where they come together. This requires the removal of the paint where these surfaces touch. The paint can be removed most easily by using a good commercial paint remover, such as can be obtained at any paint store. The paint remover should be applied with a small brush, stroking in one direction only and adding to it is required to compensate for evaporation. When the paint is sufficiently soft, it may be taken off with steel wool. Since the paint remover evaporates rapidly, it is best to work on only a small area at a time.

The holder for the station-operator license is made of two pieces of blue-tinted celluloid each measuring $3\frac{1}{8}$ by $4\frac{5}{8}$ inches. One of these requires a cut-out measuring $2\frac{5}{8}$ by $4\frac{1}{8}$ inches. The celluloid may be cut easily with a knife whose blade has been heated over a gas flame. Use an old knife as this will take the temper out of the steel.

The bias battery sits in an aluminum cup measuring $2\frac{5}{8}$ by 1 inch (inside dimensions) and $1\frac{1}{2}$ inches deep. The screws which hold this cup also hold an aluminum bracket to which is mounted a Jones barrier-type terminal strip having six terminals. All connections between the power supply and the r.f. shelf are made through these terminals.

The VFO input jack, J_1, is mounted on the left side of the utility box, 7 inches from the top and 1 inch from the back. The output jack, J_2, is located on the opposite side of the transmitter, 4 inches from the top and $1\frac{3}{8}$ inches from the back. The low-pass filter is mounted vertically on the back of the transmitter just above the ventilation hole.

As furnished, the front and back panels of the steel utility box are each held by only four self-tapping screws. To insure good r.f. shielding, it is necessary to drill holes for additional screws in both the front and rear panels. A total of ten screws in each panel should be adequate. The bottom of the transmitter is covered with a piece of $\frac{1}{16}$-inch aluminum to which are attached six rubber mounting feet.

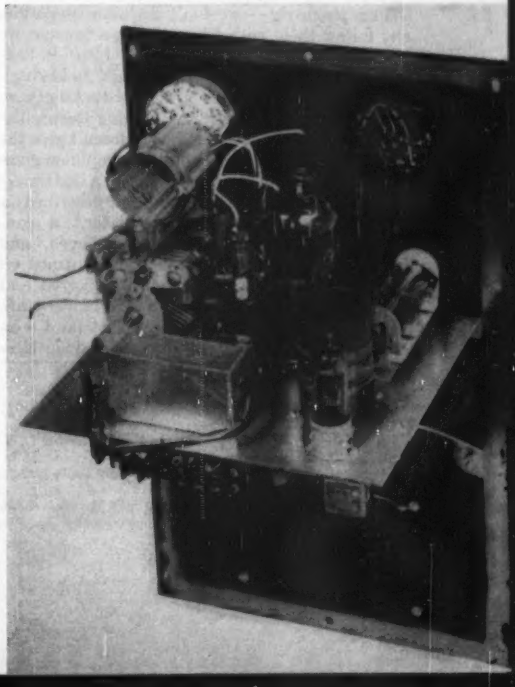
Adjustment

After checking the wiring, the rectifier and the VR tubes should be installed and the power supply tested. If the VR tubes do not glow properly, or if the voltages are incorrect, the trouble should be cleared before proceeding.

Now the 6AQ5 should be inserted into its socket and the key plugged in. Connect the VFO and set its frequency to 7.1 Mc. With the transmitter and the VFO turned on, press the key and tune the driver stage to resonance. This may be checked with a neon bulb or a pilot lamp connected to a loop of wire coupled to the driver tank coil. Due caution should be exercised when reaching inside the cabinet as death is permanent!

When the driver stage is functioning properly, the final may be tested. Turn off the power supply and discharge the filter condensers. Insert the 815 tube and turn on the filaments. Set the bandswitch to 7 Mc., the high-low switch to low and the meter switch to read plate current. Connect a 40- or 50-watt lamp to the transmitter r.f.

(Continued on page 118)



Rear view of the r.f. section. The 6AQ5 driver components and meter switch are to the right. The band-changing switch is to the left, close to the output tank coil. The aluminum box at the rear fits a biasing battery.

Chirp-Free Break-In Keying

A Solution to the Old Problem

BY BYRON GOODMAN,* W1DX

• This is an article for all c.w. men who take pride in the quality of their signals and want break-in operation without a chirp or click. It describes a system that involves a few tubes used for nothing but control and keying purposes, but there's nothing complicated and critical of adjustment about the device.

WHERE and how to key a transmitter is a problem often dismissed as a simple little item that can be readily solved by breaking the oscillator cathode circuit with the key and biasing the following stages close to or beyond cut-off. This is a perfectly logical approach if you never bother to listen and find out how your signal actually sounds, if you never operate on frequencies higher than 7.2 Mc., and if an FCC monitoring station never picks you up for chirps and/or clicks. But the sad truth of the matter is that a keyed oscillator followed by several fixed-bias stages is almost bound to have clicks,[1] and a softly-keyed oscillator is almost sure to show chirps on the higher frequencies.

On the other hand, keying the output stage usually results in a nice-sounding signal (once the keying is properly "shaped" to remove clicks), and all that is required of the free-running oscillator is that it have low drift and be well-enough isolated from the keyed stage so that it isn't "pulled" in frequency. It's really no different than a 'phone rig — we don't modulate oscillators and follow them with Class C stages because we would run into all kinds of f.m. ("chirp" in keying) and envelope distortion ("clicks" in keying).

But the clinker lies in the fact that a lot of c.w. men like to operate break-in. Keying the oscillator is the simplest solution, but it doesn't give the best-sounding signal. Keying the amplifier gives the best signal but it makes break-in a little awkward. Three approaches have been described: a weak continuously-running oscillator,[2] a conversion exciter in which the mixer is keyed,[3] and some device whereby the oscillator is turned on fast just before the output stage is keyed and turned off after the output stage is blocked off. This last approach can involve a fast (and relatively expensive) relay[4] or it can be done electronically.[5] The first two approaches are still subject to "sharpening" by later stages,[1] and the last solution "holds in" so long that the oscillator opens up only between words when the sending speed is anything over 20 w.p.m. or so. The system to be described is a modification of this last keying method that even opens up between high-speed dots, and so the chief objection to the system is eliminated.

Before we promise the world on a platter, it's only fair to point out that this particular keying system is used in a 150- to 300-volt positive lead, so it is applicable primarily to keying a low-voltage triode or the screen circuit of a tetrode. It can be used at higher voltages but it involves components with higher ratings.

Screen-Grid Keying

To understand the system, let's first consider screen-grid keying. A typical circuit is shown in Fig. 1A. With the key up, the screen is at a negative potential (necessary to cut off the tube completely). With the key down, the screen is positive, at a voltage determined by the drop through

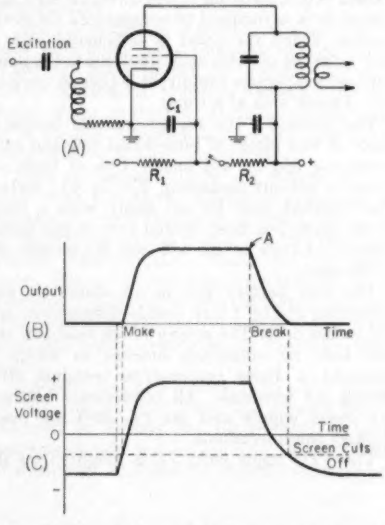


Fig. 1 — A typical screen-keyed stage (A). Returning the screen to a negative source through R_1 minimizes the backwave. The output varies as (B), and the actual screen voltage is shown at (C).

R_2. To avoid excessive current through R_1 with the key down, the value of R_1 is usually high. The keying is "shaped" by the value of C_1. On make, C_1 charges through R_2 and on break, C_1 discharges

* Assistant Technical Editor, *QST*.

[1] Carter, "Reducing Key Clicks," *QST*, March, 1949.

[2] Smith, "A Solution to the Keyed-VFO Problem," *QST*, Feb., 1950.

[3] Bartlett, "A Beat-Frequency Exciter for Better C.W. Signals," *QST*, June, 1952.

[4] Goodman, "Improved Break-In Keying," *QST*, March, 1948.

[5] Puckett, "'De Luxe' Keying Without Relays," *QST*, Sept., 1953.

through the effective screen resistance and R_1. Thus, making C_1 larger makes the keying softer. The shape of the keying might look something like Fig. 1B, since the voltage on the screen grid looks like Fig. 1C.

We can use this keying circuit to turn on the oscillator before the output starts and off after the output finishes by adding the circuit of Fig. 2. The amplifier screen keying is the same as in Fig. 1A, except that some fixed cathode bias has been

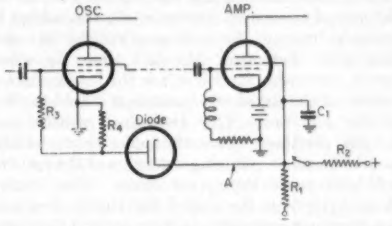


Fig. 2 — **By adding fixed bias in the cathode of the keyed stage and a diode control tube to the oscillator, the oscillator can be turned on before the amplifier and turned off after the amplifier cuts off. This is the basic principle of the break-in system.**

added. The oscillator grid leak has been divided into two resistors, R_3 and R_4 — their total makes up the normal oscillator grid leak. When the key is closed and opened, the voltage at point A behaves practically the same as shown in Fig. 1C. When this voltage is negative with respect to ground, the diode conducts and the junction of R_3 and R_4 is negative, cutting off the oscillator. When point A is positive, the diode no longer conducts, and the oscillator turns on. The amplifier doesn't come on immediately, because the voltage at point A must continue positive until it overcomes the cathode bias of the amplifier.

This, then, is the basic principle of the break-in circuit. Don't worry about the cathode bias (shown as a battery) — one or more VR tubes in parallel are used there.

However, as shown, the circuit has one clinker — the oscillator "holds in" too long. This is inescapable because of the shape of the characteristic on break. To avoid a click on the start of the break characteristic (point A in Fig. 1B), the voltage must start down slowly. This means that it tails off quite slowly (relatively) at the bottom. To get around this, the circuit of Fig. 3A has been used for several years at W1DX to shape the keying. Considering the voltage E_{out}, it will have a low value with the key up, because the grid of the tube is connected to cathode through L_1, and the tube draws current limited by the value of R_2. R_2 has a high value, and most of the supply voltage appears across it. When the key is closed, the grid goes negative at a rate determined by C_1 charging through R_1, and the voltage E_{out} rises in the same manner, as shown in the "make" portion of Fig. 3B. On "break" the condenser C_1 discharges through L_1, and the particular beauty of it is that it starts out slowly and gives a rounded corner. Normally, discharging a condenser through an inductance would result in an oscillation (shown dotted in Fig. 3B), but when the grid goes positive, grid current is drawn and absorbs the stored energy in the circuit (the grid circuit acts as a diode "damper") and the actual voltages are as shown by the solid lines. A key with a back contact is hard to come by, of course, so a small s.p.d.t. relay is used where the key is shown. The relay doesn't have to be particularly good, although it should follow well at your keying speed and operate with a minimum of bounce.

To apply this shape to the keyed stage, the signal is fed to a cathode follower, as shown in Fig. 3C. To bring the grid of the cathode follower to a negative voltage, the cathode of the shaper tube must be at a negative voltage, so the voltage divider, R_4R_5, is required. Making R_4 variable permits the key-down plate potential of the shaper (and hence the key-down output potential of the cathode follower) to be set at any desired level within the range of linearity of the shaper and cathode follower. Since this controls the screen voltage on the keyed stage, R_4 is thus a convenient output or "tune-up" control.

Break-In Operation

The circuit of Fig. 3C is ideal to use with the oscillator keyer of Fig. 2, because the screen volt-

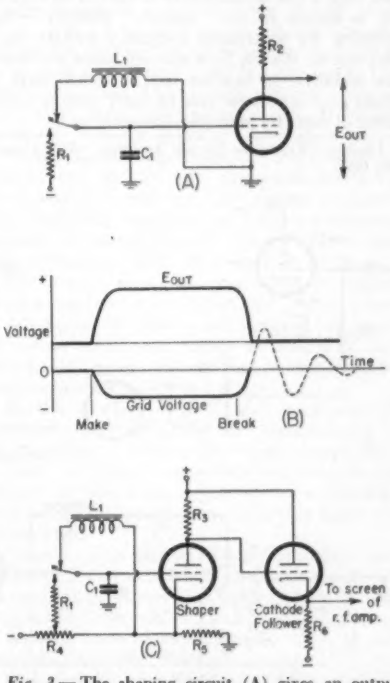


Fig. 3 — **The shaping circuit (A) gives an output voltage as shown at (B), by charging C_1 through R_1 on make and discharging C_1 through L_1 on break. This shape can be applied to the keyed stage through a cathode follower, as at (C).**

age of the amplifier now turns off fast and the oscillator doesn't hold in too long. Combining the two circuits gives a break-in system in which the oscillator practically follows the keying, but it is on and running before the amplifier puts out, and it turns off after the amplifier is cut off.

As mentioned earlier, this circuit is not a cure-all and end-all to your keying problems. It is admirably suited for keying a 6146 tetrode amplifier, because the operating bias is only 85 volts and the cathode bias can be handled by a couple of VR-75s (overloaded slightly, we must admit). An 807 can be handled in much the same fashion. If the cathode follower is made to handle the current, and you have a high-powered tetrode output stage driven by a stage that uses on the plate the same value of voltage that the tetrode uses on the screen, the W6BET keying system [6] can be used.

The circuit in Fig. 4 is that used at W1DX to key a 6146 output stage and, as such, should be applicable to any rig using a 6146 or 807. The oscillator is a 6AC7 series-Colpitts, with its plate and screen voltages stabilized by a VR-105. The normal 0.1-megohm grid leak has been split into the two values shown. The cathode of the 6146 is held above ground by the two VR-75s, which have 470-ohm resistors to their anodes so that they will both ignite when the 6146 draws current. With the key up, only one VR-75 conducts, and only a few milliamperes at that. The switch, S_1, is shown in the "operate" position — for spotting the transmitter frequency without putting out on the air, S_1 is opened. Since you want the oscillator to turn on fast, it should have a small grid condenser and be built with a minimum of capacity shunting the leads to S_1.

[6] Ballou, "Keying the Tetrode Amplifier," *QST*, December, 1947.

Although outside our experience with the system, it should be pointed out that there is a possibility of over-all feed-back and oscillation if oscillator and amplifier are on the same frequency.

The 6Y6 cathode follower and the 6H6 have their own heater supply (its center tap is tied to the 6Y6 cathode) to avoid any cathode-to-heater troubles, and the 6J5 heater also runs on a separate transformer winding. The inductance at L_1 has to be large, on the order of 300 or 400 henrys, and these chokes have quite a lot of resistance of their own. However, R_1 was added in series to increase the resistance still further and thus slow down the "break" time. In other words, increasing R_1 will soften the break characteristic of the signal and increase the hold-in time of the oscillator. The 2400-ohm resistor and 0.1-μfd. condenser gave the make characteristic we liked best — reducing the value of the resistor will give more thump on make. The 16-μfd. electrolytic from the arm of the 10,000-ohm output-level potentiometer is there to hold the make characteristic independent of the setting of the potentiometer. The 44,000-ohm resistor, in conjunction with the 10,000-ohm potentiometer, puts the cathode of the 6J5 at the proper potential to bring the cathode of the 6Y6 cathode follower to about −15 volts when the key is up.

Any pet relay you have around that will key without bounce should be satisfactory. We used a Price type 400, which is a compact little job that draws about 12 ma. at 6 volts. Using a dropping resistor, it is a simple matter to run it from a d.c. source somewhere in the rig. The arm is connected electrically to the frame, so the frame must be insulated from ground in this case.

Other combinations can, of course, be worked

(*Continued on page 114*)

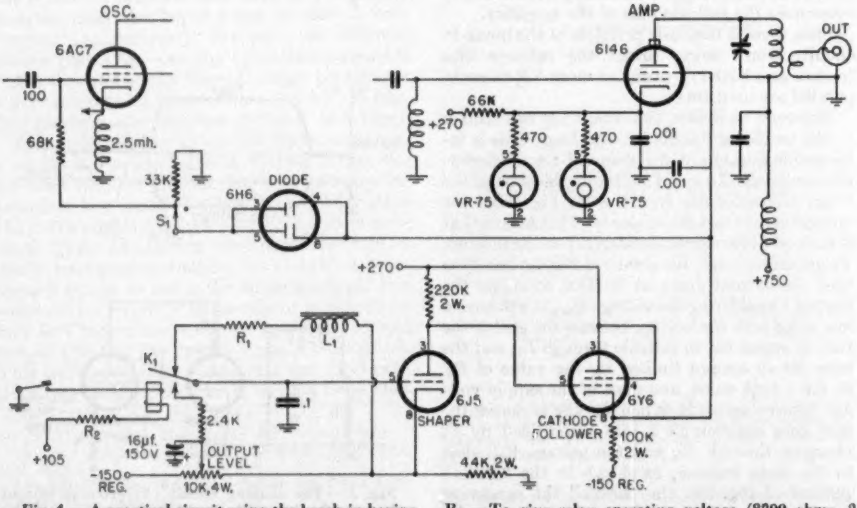


Fig. 4 — A practical circuit using the break-in keying system.
L_4 — 350-hy. 5-ma. choke (Thordarson T-20C50).
R_1 — 1000 ohms.
R_2 — To give relay operating voltage (8200 ohms, 2 watts if Price 480-ohm relay is used).
K_1 — S.p.d.t. relay (e.g., Price type 400, 6-volt 480-ohm coil).

More Sugar-Coated Single Sideband

How To Tune S.S.B. on Any Receiver

BY RICHARD B. BLANCHARD, JR.* W6UYG/QYR

• Here are some helpful hints that will quickly give you the knack of receiving s.s.b. signals with your present receiver. As W6UYG points out, it's the know-how, not the equipment, that does the trick.

IN the course of ordinary s.s.b. activity, at least once a day I still run across some ham who has not yet learned how to tune in s.s.b. In extreme cases he doesn't even recognize it when he hears it, and merely says, "There's something wrong with your audio, OM. It sounds distorted."

This condition, while perhaps understandable, is untenable in today's enlightened era. Single sideband, the "coming" answer to QRM, fading, TVI, and other problems, is not "coming" — it is actually here. And, to carry the thought further, no thinking amateur who has anything but a backward-looking "down-with-progress" viewpoint will spend a lot of money to put on a power-wasting carrier-type a.m. rig in this day and age.

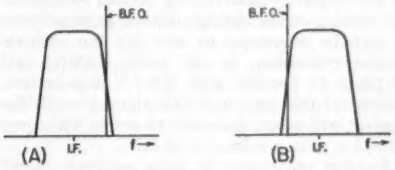


Fig. 1 — For the proper reception of s.s.b. signals, the b.f.o. must be tuned to one side or the other of the i.f. passband.

No expense, however, is involved in pursuing the object of this article — namely: How to tune in the stuff.

Right here I state flatly that *s.s.b. can be received on ANY receiver in proper working order.* It may not receive it *well*, but it *can* be copied. I have heard many hams say they have tried time and again, but their own particular receiver just wasn't designed for s.s.b. and, therefore, just *can't* pull in the stuff. This fallacy is quite popular, but it just isn't so. Any good s.s.b. signal can be copied, and your reception of all other types of emission improved at the same time, by the simple expedient of using your receiver properly, just as it sits there on the table leering at you.

It doesn't take a lot of deep theory to do the job. After all, you don't see the inside of your receiver when you tune it. However, some working knowledge of what is happening inside should help, and make the s.s.b. tuning that much simpler.

To start with, the s.s.b. signal is only half as wide as a standard (old standard) 'phone signal. Therefore, all ideas of wide-band i.f. strips can be forgotten. There is one s.s.b. adapter in use today, known as the "Signal Slicer," which does require an old-fashioned wide-band i.f. amplifier in your receiver, but this writer does not see its advantage except in the simplicity in switching from one to the other sideband of an a.m. signal.

So, first you have the selectivity problem. The ideal receiver will have an i.f. amplifier that will pass a band of frequencies 3 kc. wide. The selectivity curve will have a flat top and vertical sides, as expressed in the usual ideal selectivity curve (Fig. 1). A s.s.b. signal coming down this i.f. strip will not be altered in any way, but QRM and noise will be greatly attenuated. Placing the locally-generated carrier on the proper side of the signal, depending on the sideband in use, finishes the first part of the job. Therefore, your b.f.o. must be capable of shifting across the i.f. passband at will. (The "Signal Slicer" uses a fixed b.f.o. with the passband selected either above or below the oscillator's frequency.)

Now, all this may have become somewhat complicated, so let's refer again specifically to the average ham receiver. Let's assume you have your selectivity sharpened to the point where a regular a.m. station sounds "bassy" unless you tune off center. You don't have to do this to receive a s.s.b. signal, but this is just by way of illustrating how much selectivity you can use if it's available. Incidentally, when you tune off center on an a.m. signal to get rid of the "bassiness," you're more or less just listening to one sideband. Painless so far, isn't it?

In the average receiver, this selectivity is provided by a crystal filter, and thereby hangs a disadvantage. A crystal filter is far from "flat-topped," and so a compromise will have to be arrived at where the selectivity is sufficiently rounded off on top to allow the entire signal to get through.

Like c.w., s.s.b. signals are varying signals, and therefore the a.v.c. action in your receiver should be disabled. Most receivers do this automatically when the b.f.o. is turned on, although a few have a separate switch. In any case, a.v.c. is *not* wanted unless other measures are taken.[1]

Since the s.s.b. signal is varying, you therefore need enough b.f.o. injection to provide a carrier that the incoming signal will modulate not more

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than 100 per cent. See what it looks like at the second detector? It's a plain a.m. signal with only one sideband.

In most receivers the b.f.o. injection is a fixed amount, and the incoming signal is often strong enough to "overmodulate" your b.f.o. carrier, and the result is the distorted signal that makes many hams claim their receivers will not work on s.s.b. The remedy is simple. Merely reduce the incoming signal to a value that will not overmodulate the b.f.o. And here comes rule No. 1 in s.s.b. reception: *Always use all the audio gain you have available. Audio gain wide open.* Your "volume control" is the r.f. gain control (sometimes marked "sensitivity"). Thus, you can easily balance the incoming signal with your b.f.o. to present a properly-modulated signal to your second detector.

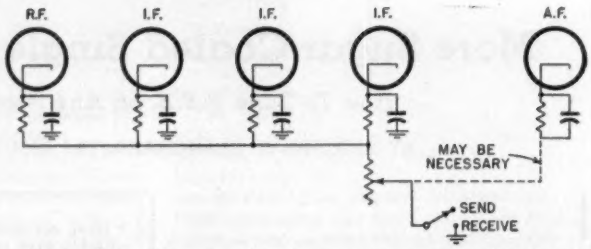


Fig. 2 — If the send-receive switch of your receiver turns off the entire B+ supply, rewiring it in this fashion will minimize the drift during transmissions. If the audio is disabled, the by-pass condenser should be left across the bias resistor, to avoid possible breakdown of a low-voltage electrolytic condenser.

The above-outlined steps make it possible for you to tune in an s.s.b. signal. The procedure for a given station is this: With the b.f.o. off, tune in the station for maximum audio volume. Disregard intelligibility for the instant. Once that spot is found, leave the tuning dial alone. Do not move it again for any reason. Turn on the b.f.o. and slowly tune its "pitch control" across the i.f. channel until at one critical point you will find that you can understand the signal. Use only enough sensitivity to make the signal audible. Leave the audio gain wide open. Once the signal is tuned in, the crystal filter can be adjusted to remove heterodynes or other QRM in the usual manner, with considerably more possibilities than on what we have come to call "a.m."

After this setting of the b.f.o. with respect to the receiver i.f. has been found, future tuning of s.s.b. signals can be done with the main tuning dial. This may be awkward if the receiver tuning rate is too fast (not much bandspread), and it will require more careful tuning than is required with an a.m. signal. Log the setting of the b.f.o. so that you can always come back to it. There are two settings of the b.f.o. that may be used, corresponding to setting it to one side or the other of the i.f. passband, as shown in Fig. 1.

The receiver at W6QYR uses a BC-453 Q5-er after the SX-17. The b.f.o. in the Q5-er is set by screwdriver adjustment on the high side of the 85-kc. i.f. in the Q5-er. It is switched in when listening to a low-sideband signal. For the high sideband, the SX-17 b.f.o. is switched to the "on" position.

Some 'phone men have "let their b.f.o. go," and find it will not even work at any setting of the pitch control. This is easily remedied. With the pitch control set at about a midpoint, tune the screwdriver adjustment usually found inside the set to put the b.f.o. in the center of the i.f. passband. This may be quickly done by listening to the hiss from the b.f.o. signal and tuning for the lowest pitch hiss.

Refinements

Many receivers disable the entire B+ supply during transmitting periods. This is no good, and is easily changed, as shown in Fig. 2. Lift the ground connection on the r.f. gain control, and switch it on and off instead of the B+. Then all the frequency-determining circuits remain on, but nothing comes through the set. In some cases it may be necessary to also lift the cathode ground connection in the audio stage(s) and switch it in parallel with the r.f. gain return. Connected this way, and with the a.v.c. off, the receiver will return instantly to action when you stand by, with a minimum of drift.

Another refinement in older receivers might be to install voltage regulation. However, since you are leaving the set on all the time with the above changes, once warm it should stay on the nose for long periods of time. My set is a prewar SX-17 with no regulation, and it comes back right on every time.

Summary

Use these rules, and your receiver will do you more justice in the future on s.s.b. signals.

Rule 1: Always keep the audio gain wide open.

Rule 2: Always keep the a.v.c. off.

Rule 3: Use only enough r.f. gain to hear the signal adequately.

The use of a.v.c. in s.s.b. reception requires an external oscillator for best results. The subject was covered very well by W9OHM recently.[1]

[1] Wright, "Carrier Generators for S.S.B. Reception," *QST*, Dec., 1952.

MIDWEST DIVISION CONVENTION

Lincoln, Nebr., October 10th–11th

The Lincoln Hotel in that Nebraska city will be the center of plenty of amateur activity October 10th–11th when the Lincoln Amateur Radio Club puts on the 1953 Midwest Division Convention. There will be technical sessions, displays of the newest in equipment, discussion of civil defense communications, a hidden-transmitter hunt with a new twist, net operation and other group meetings. A. L. Budlong, W1BUD, will attend from ARRL Hq. Highlights of the entertainment program are a dinner and dance for Saturday night, with the banquet on Sunday. A special program has been arranged for the YLs and XYLs. Registration is $8.50 per person, or $7.50 if made before September 30th. Write F. B. Johnson, W9JDJ, P. O. Box 252, Lincoln 1, Nebraska.

Suppressing TVI in the Meissner Signal Shifter

Tips on Shielding and Filtering

BY LEWIS G. McCOY,* W1ICP

In traveling around the country, giving talks on the causes of and cures for TVI, one of the most frequent questions asked about a particular piece of equipment has concerned the Meissner Signal Shifter. It appears that many amateurs are owners of Signal Shifters, anxious to de-TVI them, but don't know how far they may have to go with shielding and harmonic attenuation. Also, several inquiries have been received at Headquarters concerning the Shifter. Some amateurs, like Tom Passons, W4SGU, have sent in excellent descriptions of how they worked over their units so they wouldn't cause TVI to the channel or channels in use in their area.

The Signal Shifter, like many pieces of gear that were manufactured prior to the time of great TV interest, has no provision for the attenuation of v.h.f. harmonics. As a result, the Shifter does a good job of creating interference to television reception, particularly on Channels 2 through 6. In fact, in the case of the Model 9–1090 Shifter, worked over by the writer, there was enough harmonic output to wipe out a fairly strong TV signal on Channel 6, even though the unit was operating on 80 meters. Fortunately, the Shifter is constructed in such a manner that it is not too difficult to bring harmonic output down to a satisfactory level for most locations. The measures discussed in this article may also apply to other equipment, whether commercial or home-brew.

Naturally, such factors as TV signal strength, nearness to neighboring receivers, bands of operation, and the channel or channels in use, will have an influence on the minimum amount of work that need be done for a given locality. The best approach to cleaning up a piece of gear is to take a step at a time, testing for TVI after each modification is made. This is the only simple way to determine how much harmonic suppression is needed for a particular case. It actually can be an absorbing and interesting task as each step is checked and obvious progress is noted.

Terminals

The first step in debugging the Signal Shifter is the removal of the isolantite output terminals and replacing them with a coax jack. This should be fastened on the rear apron of the chassis after removing paint around the mounting hole. In its original condition, the Shifter has a short piece of 300-ohm line running from the bandswitch contacts to the isolantite stand-offs. The 300-ohm line is removed, and one of the output bandswitch contacts is grounded while the other contact is soldered to the inner conductor of the coax connector. In several cases where there was a fairly strong TV signal to work with, the installation of the coax output, and the use of a low-pass filter at the output, proved to be enough to clear up TVI when the Shifter was being used to feed the antenna. If the unit is used as a VFO, it is connected with coax directly to the stage being excited.

Shielding

Step 2 is to seal up the major leaks in the cabinet. For this operation, a can of paint remover and some sandpaper are "must" items. The paint on the cabinet is baked on and a lot of scraping and sanding will be eliminated by using paint remover.

The back of the cabinet has a large opening for 115-volt, control and the output connections. It is necessary to cover this area with a metal plate three inches wide and the length of the cabinet. Either copper flashing or sheet aluminum will make a good cover. Before mounting the plate, the paint should be removed from the outside of the cabinet, around the opening. The mounting holes for the cover should be spaced not more than four inches apart, and of correct size for

(*Continued on page 116*)

Top view of the Signal Shifter, showing the home-made shield can over the 807. Also shown is the strip of metal forming the lip at the rear of the opening to seal the slit along the hinge.

* Technical Assistant, *QST*.

A Wide-Range High-Power Pi-Network Final

3.5 Through 54 Mc. Without Plug-In Coils or Switching

BY A. A. FARRAR,* W1CLS

• Because of its elimination of the ills associated with either switched or plug-in coils, the pi-network amplifier with variable inductor has become very popular in recent months. Here we have a design that covers all amateur bands from 3.5 through 54 Mc. — at the kilowatt level, if you want to use it that way.

A RECENT article by George Grammer [1] has described a modern application of the pi network to a high-power final amplifier that should go a long way toward satisfying the amateur's desire for convenience and simplicity, and at the same time bring to bear techniques for the prevention of TVI through the elimination of spurious radiation. That design resulted in an amplifier in which a few watts from the exciter was stepped up several hundredfold within an electrically tight box, with the only exit via the coaxial output connector; and this through the frequency range 3.5 to 30 Mc.

This design seemed to fulfill many of the writer's objectives, including shielding, compactness, and no plug-in coils; however, its upper frequency limit was 30 Mc., whereas I have long been interested and active in the 50–54-Mc. band. Now if this unit could be made to work at 50 Mc. without sacrificing its lower-frequency performance, we felt that we would really have something. Accordingly, the project was undertaken with the result illustrated in the accompanying photographs.

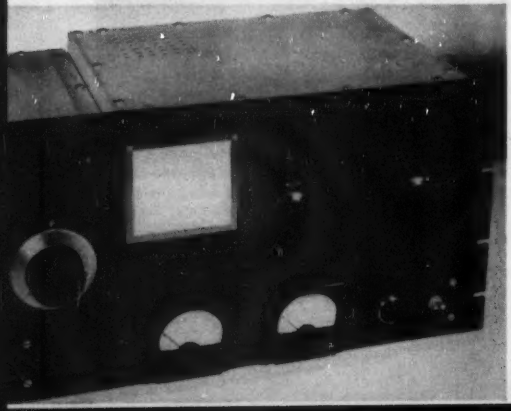
At the outset it was determined to adhere as closely as possible to the original design and layout, and to deviate only to the extent necessary to obtain satisfactory performance at 50 Mc. Examination of the accompanying photographs and comparison with those in the original article will readily indicate the similarity. Any reader seriously considering undertaking the construction of this amplifier unit is encouraged to brush up on the subject of pi-network amplifiers discussed in *QST* in recent months. [1, 2, 3] This homework will prove well worth the effort and contribute to a clearer understanding of the construction and operation of the unit.

* % Raytheon Manufacturing Company, Waltham 54, Mass.

[1] Grammer, "Pi-Network Tank Circuits for High Power," *QST*, Oct., 1952.

[2] Grammer, "Practical Applications of Pi-Network Tank Circuits for TVI Reduction," *QST*, Jan., 1952.

[3] Technical Topics, "Pi-Network Design Curves," *QST*, April, 1952.

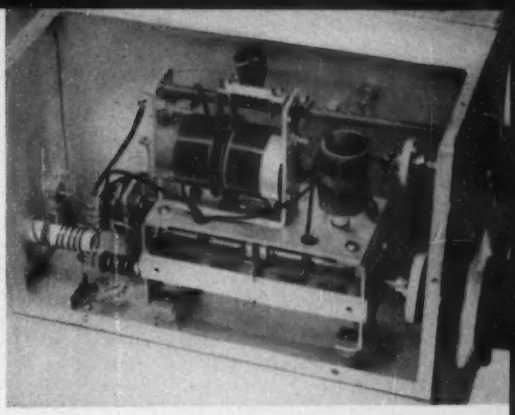


A high-powered pi-network final for 3.5 through 54 Mc. Complete with meters and shielding enclosures, it mounts on a standard 10½-inch rack panel. Pointer knobs at the upper left are for the swinging link and the grid switch, S_1. The grid tuning dial is just below. Counter dials, at the right, are for the vacuum tank condenser and the variable inductor. The pointer knob between them controls the output capacitor switch, S_2.

Circuit and Components

It was realized at the outset that, in order to get the high-frequency limit of the amplifier to 54 Mc., it would be necessary to employ a tank condenser with a sufficiently low minimum capacity to permit tuning to the highest frequency of 54 Mc. with a tank coil of reasonable proportions to maintain a decent Q at this frequency. It was also necessary that the maximum capacity be no less than 150 $\mu\mu$fd. to tune to 3.5 Mc. with a 15-μh. main tank inductor. The Eimac data sheet for the 4-250A tube specified the output capacity to be 4.5 $\mu\mu$fd. and this, added to the circuit wiring of 3 or 4 $\mu\mu$fd. plus that of the neutralizing condenser, gave a fixed minimum of approximately 10 $\mu\mu$fd. This was two thirds of the total minimum desired and meant that the minimum of our tank condenser should be about 5 $\mu\mu$fd.

Now a tuning condenser with a range of 5 to 150 $\mu\mu$fd. is a hard item to come by, and a search of the catalogs showed that the closest approach would be found in a variable vacuum type. It was found that a recent addition to their line had been made by Jennings and designated ACTS-150. Its minimum is 10 $\mu\mu$fd. and the maximum capacity is 150 $\mu\mu$fd. It is rated at 10,000 volts. This is a moderately expensive item, but considering its capability, its cost is



Looking into the grid compartment of the wide-range amplifier, showing the multiband grid circuit. The separate 50-Mc. input circuit is seen at the lower left.

justified. Another model is available with a capacity range of 7–200 μμfd., but since the higher capacity is not needed in this amplifier, the added cost did not seem justified to obtain the slightly lower minimum capacity. Use of the ACTS-150 has been most satisfactory and actually is the key to the success of this amplifier.

The next item of concern was the plate choke which, as pointed out before, is no little problem in any amplifier using shunt feed to the tube. The National R-175 had been modified previously by Grammer to work satisfactorily, so the changes outlined by him were made on one of these units. Incidentally, before modification it was found to have a very pronounced series resonance at 20.5 Mc.; consequently, its operation at 21 Mc. would be most unsatisfactory. After the Grammer modification, there were additional series resonances just below 50 Mc. and just above. Additional changes were made in Sections 1 and 5, and all series resonances were removed from all amateur bands from 3.5 through 54 Mc. Details of the modified choke are shown in Fig. 1.

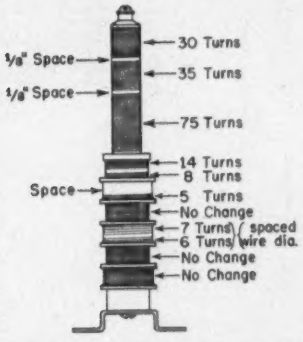


Fig. 1 — Modifications made in the National R-175 choke to remove resonances in all bands from 3.5 through 54 Mc.

The B&W 3852 500-watt variable inductor was used, since it had been previously proven satisfactory and had the required maximum inductance to tune to 3.5 Mc.

For the grid tuning unit, we used the National MB-40-SL, a new design with a swinging link which greatly facilitates the problem of controling the excitation over the wide range of frequencies involved. The schematic, Fig. 2, shows the details of the hook-up. We used a separate grid circuit for 50 Mc. with a slug-tuned coil adjustable from the rear of the shield compartment and switched in and out of the circuit by means of a double-pole double-throw miniature ceramic wafer switch, S_1. The two poles of the switch control the grid of the tube and the excitation input.

In the unit to be described, we have used the Eimac 4-400A, although the 4-250A will work equally well, and for those who may not care to run as much power, the 4-125 will work most satisfactorily. Any of the tubes can be readily plugged into the socket, since the filament voltage is the same in each case. Only the current would differ and some slight readjustment of the neutralizing capacitor would undoubtedly be necessary.

Plate Circuit

In the plate circuit, L_1 is the 50-Mc. coil, adjusted to resonate at 54 Mc. with C_3 set very near minimum capacity. L_2, the variable inductor, is connected so that the unused portion of the coil is shorted out. This precaution is necessary to prevent 50-Mc. series resonance in the coil. L_3 and C_4 are adjusted to series resonate in Channel 7 — this being a channel of interest in our area. L_3 in this case is merely the lead of the capacitor. There is one other item of departure in this plate circuit which should be mentioned, and that is C_5. This small variable air condenser is the only output condenser in the circuit at 50 Mc. An air-spaced condenser was used here because difficulty would have almost surely been experienced had a mica capacitor been used, because of the currents involved at this frequency.[1,2] Capacitors C_6 through C_{11} are 2500 volts, case Type CM-45, and are mounted in a stack at the rear of the chassis.

Mechanical Considerations

The unit is constructed on a standard aluminum chassis 10 by 17 by 3 inches. The larger of the two shielded compartments measures 10 by 13⅜ by 7¼ inches, with the top and bottom edges bent over to form ¾-inch lips. The smaller of the two compartments measures 10 by 6½ by 3½ inches with ½-inch folded edges for mounting purposes. After drilling, but before final assembly, the aluminum chassis and compartments were finished by soaking for approximately 30 minutes in a strong lye solution, then scrubbed

with hot water and soap, and rubbed down lightly with steel wool to the desired finish.

In connection with drilling and tapping the edges of the compartments, it would be desirable to use screw inserts or something similar in order to prevent the threads in the aluminum from wearing out after inserting and removing the screws a few times. Several varieties of inserts, captive nuts, and similar items of convenience can be obtained in any large hardware store.

The socket for the tube is mounted above the chassis for reasons previously pointed out.[1] Air holes are drilled in the chassis directly beneath the socket and corresponding to the hole line-up in the socket. The center hole is ½ inch and five additional holes are approximately ⅜ inch in diameter. There are no holes in the box, and care has been taken to insure tight mechanical fit between the top, bottom, and sides, to prevent air leakage at these points.

Wiring is simplicity itself, and is done with shielded wire with disk-ceramic capacitors across each end of each wire.[4] Wiring is routed around underneath the chassis in conventional fashion. With respect to the tube socket, the filament and screen-lead shield are grounded to a soldering lug, where the wires pass through the chassis, and by-pass capacitors C_{13} through C_{16} are likewise grounded at this point.

Cooling is accomplished by mounting a small blower underneath the chassis. A bottom plate is used on the chassis. Air is pulled in through a 3-inch hole at the rear edge of the chassis and is forced up through holes underneath the socket, thus cooling the seals of the tube, and is vented out of the box through a series of ¼-inch holes directly over the tube on the top cover. Since the photograph was taken, copper screen has been placed across the entrance hole to prevent a small amount of radiation through this outlet. Too much importance cannot be placed upon the matter of getting adequate ventilation for the tube. This is the principal limiting factor in the amount of power which can be run to this unit aside, of course, from the tube ratings. A more efficient method of ventilation would be to mount a blower with an enclosed impeller ex-

[4] Grammer, "By-Passing for Harmonic Reduction," *QST*, April, 1952.

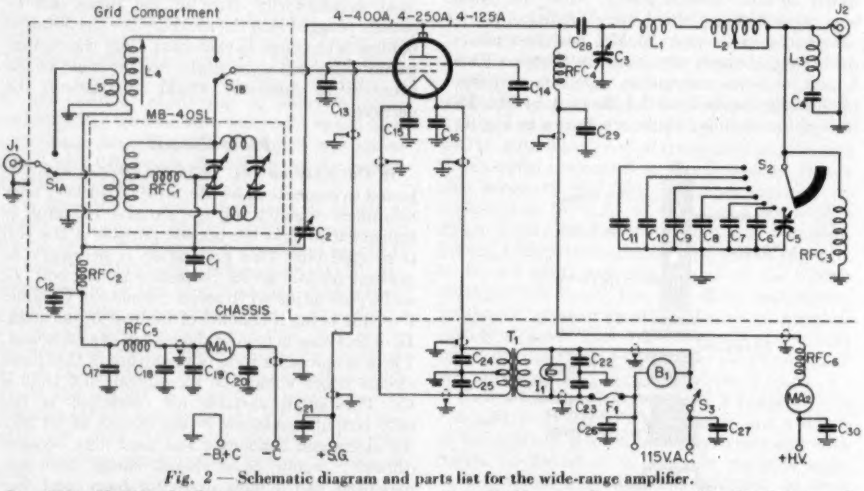
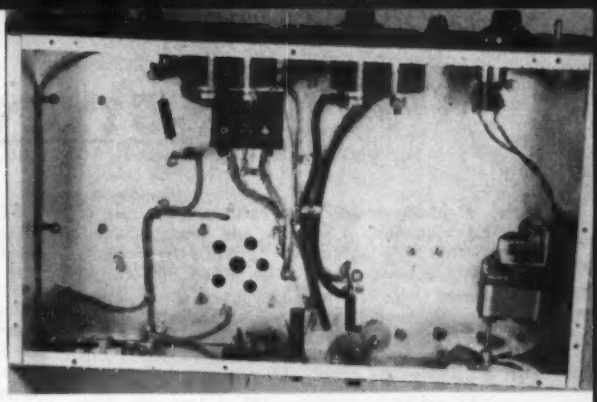


Fig. 2 — Schematic diagram and parts list for the wide-range amplifier.

C_1 — 180-μμfd. 500-volt silver mica.
C_2 — 2–4 μμfd. neutralizing condenser (National NC-800A).
C_3 — 10–150 μμfd. vacuum variable (Jennings type ACTS-150).
C_4 — 25 μμfd., 1500 volts (see text).
C_5 — 140-μμfd. miniature variable (Hammarlund type APC-140).
C_6, C_7, C_8 — 100-μμfd. mica, 2500 volts (Type CM-45).
C_9, C_{10} — 250-μμfd. mica, 2500 volts (Type CM-45).
C_{11} — 500-μμfd. mica, 2500 volts (Type CM-45).
C_{12} to C_{33}, incl. — 0.001-μfd. disk ceramic.
C_{24}, C_{25}, C_{26}, C_{27} — 0.005-μfd. disk ceramic.
C_{28}, C_{29}, C_{30} — 500-μμfd. ceramic, 10,000 volts (Centralab TV3-501).
L_1 — 50 Mc.: 3 turns No. 10, ¾-inch diam., 1⅛ inches long.
L_2 — Variable inductor, 15 μh. (B&W type 3852).
L_3 — To series-resonate with C_4 at desired TV frequency.
L_4 — 50 Mc.: 6 turns No. 20, 1 inch long on ⅛-inch slug-tuned form.
L_5 — 50 Mc., coupling 4 turns No. 20 close-wound, adjacent to cold end of L_4.
B_1 — Blower and motor, 115 volts a.c. (available from Allied Radio Corp., Chicago, catalog No. 72–702 motor and No. 72–703 fan; also available from Radio Shack Corp., Boston, Mass.).
J_1, J_2 — Amphenol coaxial chassis connectors.
MA_1 — 0–50 ma. milliammeter.
MA_2 — 0–300 ma. milliammeter.
RFC_1, RFC_2, RFC_3 — 2.5-mh. choke (National type R-100).
RFC_4 — National type R-175 choke modified as shown.
RFC_5, RFC_6 — 2-μh. choke, 500 ma. (National R-60).
S_1 — D.p.d.t. ceramic switch (Centralab type PA-2006).
S_2 — Single-circuit 10-position progressive shorting (Centralab type P-1-S wafer, or PA-2042).
S_3 — D.p.s.t. toggle switch, 10 amp.
F_1 — 2-amp. fuse and holder.
I_1 — 115-volt a.c. panel jewel and bulb.
T_1 — Fil. transformer, 5 volts, 13 amp. (UTC-S-59).
MB-40-SL — Multiband tank circuit (National 3.5 to 30 Mc.).



Under-chassis view of the amplifier, with bottom cover removed.

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ternal to the chassis and to pipe the air through a suitable flexible hose similar to the kind used in automobile heater installations. This tubing can be obtained from automobile dealers or supply houses in various sizes from 1½ to 4 inches in diameter, and is flexible enough to be handled conveniently.

Since both the vacuum condenser and variable inductor require several complete revolutions to cover their range, a form of dial that reads revolutions is highly desirable. We used a counter dial made by the Helipot Corporation. This requires no additional holes to be cut in the panel or the compartment, a point which we considered highly desirable. It is fastened to the panel by means of a ⅜-inch bushing. With this counter dial, the vacuum capacitor and the variable inductor can be reset to logged positions conveniently.

Harmonic Suppression

An additional point of interest is the use of a low-pass filter. This follows generally the design described by Tilton in April, 1953, *QST*, except that we used APC-type air condensers instead of a larger type, and have mounted the unit in a Bud type CU-3014 box measuring 2½ by 2¼ by 12 inches. The filter has a cut-off frequency of 60 Mc., sufficiently high to permit operation at 50 Mc. without appreciable insertion loss and yet it is most effective in the channels used in this area. The output of the transmitter is connected with a 50-ohm cable, RG-8/U, to a conventional parallel-tuned antenna coupler having a fixed center link. Coupling is varied by means of a 300-$\mu\mu$fd. capacitor in series with the link to ground. A standing-wave bridge is permanently connected in the coax line between the transmitter and the low-pass filter at all times. Such a device is essential in obtaining proper adjustment of the antenna coupler, and its use is highly recommended.

Operation

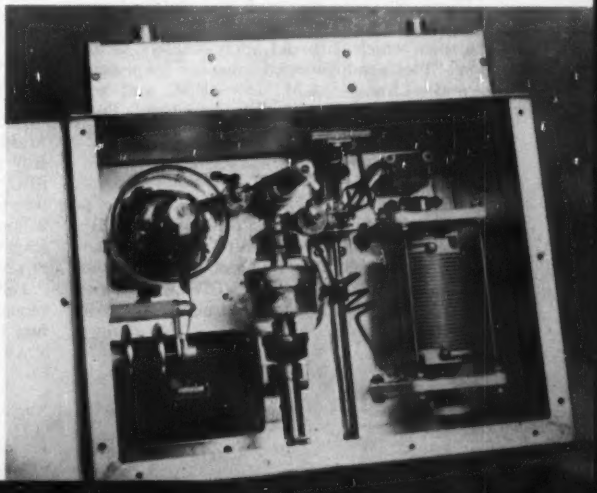
In this amplifier, the value of C_1 was reduced to 180 $\mu\mu$fd., because with the original 220 $\mu\mu$fd. neutralization occurred with the spacing of C_2 so close that we were afraid of arc-over. With the value of 180 $\mu\mu$fd. at C_1, the amplifier is neutralized on 50 Mc. with the air gap adjusted to ¾ inch. Neutralizing follows the method described by Bruene[5] of varying C_3 under loaded conditions and adjusting C_2 to obtain maximum grid current with minimum plate current. With neutralization adjusted at 50 Mc., only very slight reaction was found at lower frequencies, but was found to be of no concern.

This amplifier is driven with an exciter having a 2E26 as its output tube. This tube runs as an amplifier on all bands except 50 Mc., where it doubles. Ample excitation is obtained with an input of approximately 8 to 10 watts on all bands below 50 Mc. and about 15 watts at 50 Mc. In order to obtain uniform excitation for the amplifier at the various frequencies used, it was found necessary to remove two turns from the variable link on the MB-40 unit, in order to obtain a proper match for the RG-59/U cable used to connect the exciter with the amplifier.

No parasitic-suppressing devices were used in the plate circuit of this amplifier. Tests indicated no parasitics, due, no doubt, to the excellent low-impedance characteristics of the vacuum capacitor, C_3. It is possible that variations in layout or substitution of other tubes might result in parasitic troubles. Methods for dealing with

(Continued on page 114)

[5] Bruene, "How To Neutralize Your Single-Ended Final," *CQ*, Aug., 1950.



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Interior view of the pi-network amplifier, showing arrangement of the plate-circuit components. The low-pass filter is attached to a removable rear panel.

Strays

Coincidence goes even further in the case of Ed Mahaffey, WN4WTI, and Rex Mahaffey, WN5WTI (p. 55, July *QST*). While the two have no family relationship, the fathers of both are named Owen and both have grandfathers named George. Anybody care to figure the odds on this one?

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W3VN points out that BC-221 freqmeter users who get their necessary 105 or 150 volts from 300-volt supplies and VR tubes will endanger BC-221 by-pass condensers rated at 200 volts if VR tubes or VR-tube connections were to fail.

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W2KG, who also has the call W4VEC, recently won the British Small-bore Rifle Championship fired at Bisley, England. You had better answer this fellow's QSLs — Bill holds several U. S. and international rifle records. In fact, W2KG and W2FGU not long ago combined their sharpshooting skills to set the national Outdoor Two-man Team record for twenty shots at fifty yards with any sights. — *W2EMX*

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WØPYK, who has a 21-Mc. i.f. TV set near the shack, gave the 15-meter band a try not long ago and raised a KZ5 on 'phone. His son then turned the TV set on and the ensuing racket shook the walls of the house. WØPYK shouted to the youngster, "Turn that TV set off — you're bothering me!" A few minutes later a telephone call was received from a lady three doors down the street. Said she: "I'm sorry I interrupted your conversation . . . I turned my TV set off when you told me to."

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W9TKR, WØRQK, W1TS, Mr. Bill Richter and others have affirmed that Scotchlite reflector tape, now widely used as auto-bumper safety stripping, also looks good in the form of ham call signs.

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Pierre, S. Dak., amateurs are contemplating the placement of signs at highway entrances to the town which will read approximately as follows: "Pierre radio amateurs monitor frequencies — and — from — A.M. to — P.M. and will answer all calls from mobile operators." Such postings, of course, usually require official permission.

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W6TPR worked KH6AJF, whose name is Warren, on 40-meter 'phone recently. W6TPR's next contact was with KL7ATT, whose on-the-air name is Dean. The name of KH6AJF, plus that of KL7ATT, equals KL7ATT's full name — Dean Warren. No wonder "old man" was good enough for grandpa.

W2IKF recently encountered W2s JPG and GPJ busily pounding brass within a few 80-meter kc. of each other.

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In ordinary receiving tubes, noise from microphonics easily may be a thousand or even a million times greater than intrinsic tube noise. The National Bureau of Standards, engaged in a concentrated study of this engineering problem, announces a new "vibration generator" that produces accelerations of up to 20 times that of gravity. Its response is flat to within 20 per cent over the unusually wide range of 100 to 10,000 cycles per second. Such vibration generators heretofore have generally functioned at upper limits of 3000 cycles per second.

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In late July, when the prospect of New Mexico amateur call-sign license plates came to the attention of Mr. Will Harrison, Santa Fe newsman, he ventured the printed opinion that there were not enough amateurs in the state to justify the measure. Harrison moreover opined that only a small number of these had mobile set-ups. In the ensuing uproar, columnist Harrison offered refreshments and food to any mobile hams who would care to pay him a visit.

This was the cue for more than 100 amateurs from all parts of New Mexico to descend on Santa Fe for the purpose of setting Mr. Harrison straight regarding their hobby. The resultant organized turn-out was the largest gathering of mobile amateurs in the state's history, the most impressive group consisting of a 17-car cavalcade from Albuquerque.

The holiday spirit of this "invasion" was combined with an effective simulated-emergency civil defense demonstration. After this drill all hands converged on Harrison's home for the promised feed.

Taking much good-natured ribbing, Mr. Harrison was made an "honorary ham" and named Protector and Guardian of Mobile Amateur Radio in New Mexico. He then was presented with a mobile unit of his own — a burro equipped with transmitter and receiver — on which he willingly posed for photographers while munching paper, presumably the offending newsprint.

ARRL West Gulf Division Director A. David Middelton, W5CA; New Mexico MARS Director Roy Self, W5MOX; and ARRL's New Mexico SEC, John Harvey, W5MYI, were among those who teamed up to promote the affair successfully. Among newspapers giving the story detailed coverage were the Santa Fe *New Mexican* and the Silver City *Daily Press*.

Perhaps the conclusion to be drawn from this sequence of events is that "Hell hath no greater fury than radio amateurs scorned"!

The 'DQW Antenna for Mobile QSY

Novel System for Tuning the Whip While in Motion

BY JAY HARE,* WØDQW

In operating 75-meter mobile in Kansas, where stations are not too numerous on the air in daytime, we find it adds a lot to the number of good QSOs by having a VFO transmitter. The versatility of the transmitter is greatly improved by being able to operate over the entire band with the antenna tuned for maximum efficiency. If one has to stop the car and get out to retune the antenna, much time is lost and perhaps the station one wishes to call is also gone. With the hope of overcoming this handicap of mobile transmitters, we set out to find some means for tuning the center-loaded whip antenna quickly and easily.

The requirements seemed to be efficiency over the entire band, mechanical stability, and a weatherproof mechanism. With this in mind, and the thought of using a miniature condenser for tuning the coil, we found, rather by accident, that a small wire running through the center of the loading coil, and connected to one end, would lower the frequency over 200 kc. From this we went to a small bronze welding rod inserted into the coil form and found that a movement of 4½ inches would tune the band. With a field-strength meter set up at considerable distance from the car, and leads brought back to a milliammeter within sight, we found that no measurable efficiency was lost by this method as compared to changing the number of turns on the loading coil. This experiment led to building the mechanical mechanism into the lower portion of the antenna for operating the slug inside the coil as shown in Fig. 1.

In this case the coil form is paraffin-boiled hardwood, 1⅜ inches in diameter, with a ½-inch hole through the center. It is wound with No. 15 wire to a length of about 6 inches. The slug finally used was a piece of 3/16-inch bronze welding rod, on the upper end of which is a small stand-off insulator ½ inch in outside diameter, which slides up and down within the form for steadying the rod against vibration. A movement of 4 inches up and down in the coil tunes over the entire 'phone band. This is accomplished by the screw mechanism within the antenna, as shown in the drawing. The screw is operated by a short flexible shaft which extends down through the Master Mount heavy-duty spring, bumper mounted. The end slugs were removed from the spring, bored out, and tapped for ½-inch s.a.e. thread, then replaced and fitted with ½-inch cap screws with ¼-inch holes through their centers. One of these cap screws is welded into the bottom of the antenna. To the flexible shaft — a little below the spring — is fastened a Johnson steatite shaft insulator and to this is attached a long flexible shaft (surplus) which reaches to the dash where it is operated by a small knurled knob.

The transmitter in this case is a "Command 696" which easily tunes across the band. An r.f. meter with outside thermocouple (also surplus) is mounted near the plate milliammeter on the

(Continued on page 118)

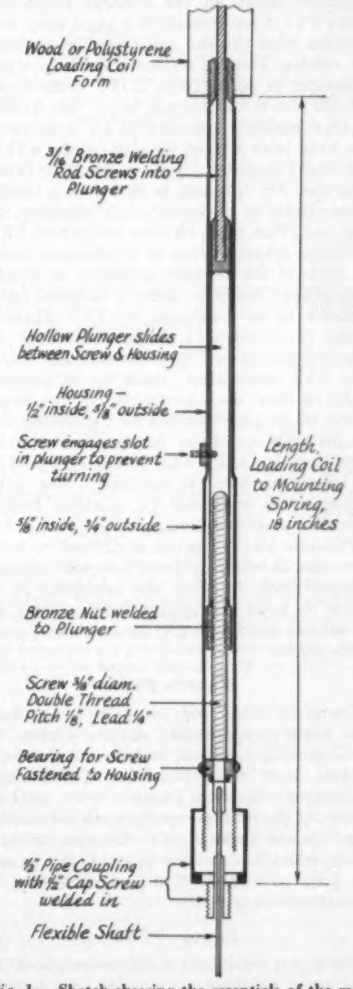

Fig. 1 — Sketch showing the essentials of the mechanism used by WØDQW to tune a mobile antenna while in motion.

* Delphos, Kansas.

TVI and the Novice

Understanding the Problem

BY LEWIS G. McCOY,* W1ICP

In the writer's capacity as an ARRL Technical Assistant it has been one of his jobs to handle correspondence with amateurs having TVI problems. A recent letter was particularly interesting because it voiced a newcomer's fears of TVI. He wrote: "I am interested in becoming a ham operator . . . however, I am quite disturbed about all the remarks being made about TVI. I am located in a small town about 60 miles from the one and only TV station we can receive. The TV station is in the process of increasing its power from 17,000 watts to 100,000; do you think this will help?" He went on: "I am completely encircled by TV antennas and also have been warned already by the wife and kids that I must not interfere with their favorite programs. My question is this: Can a beginner in ham radio do all the necessary shielding, trapping, etc., that must be done to prevent TVI?"

Here is a typical case of a newcomer voicing his fears of the nastiest problems in amateur radio today. Actually, there is no need for the beginner to be frightened by TVI. There are plenty of experienced people around to offer help and guidance. Many cities in the country have TVI committees, made up of amateurs, ready to offer their assistance. If you happen to live in an area that has no committee, there are probably amateurs in the local club who have had experience with interference and will be willing to help. In addition, your ARRL Headquarters staff will be glad to help by answering your questions.

The cure for TVI is not as difficult as it may seem, and it certainly doesn't require any great technical skill to whip the problem. In this article we hope to acquaint the newcomer with the subject and try to give him a clear approach to the answer.

What Is TVI?

There are many sources of TVI . . . industrial heating equipment, electric devices that have sparking contacts, diathermy, short-wave stations, and several others. Unfortunately, even though the ham causes a very small percentage of the interference, he somehow manages to get blamed for much of it. However, extensive public education on the part of the amateur has gone a long way toward correcting this misunderstanding.

Forms of TVI

When you enter into a discussion about TVI with your neighbor, you must be equipped with the necessary knowledge to know what you're talking about. It makes the job a whole lot easier.

There are two basic forms of interference the amateur is concerned with. First, there is the interference that comes from his station because of faults in his transmitter; and second, interference due to faulty design of the TV receiver. Obviously, one form of interference is the responsibility of the ham while the other is not. Let's for a moment discuss TVI that is caused by the transmitter.

Harmonic Interference

When an amateur turns on his transmitter he is interested in transmitting his signal on only one frequency — the "fundamental" frequency — and no others. However, it is one of the characteristics of radio transmitters that they generate energy at multiples of the fundamental frequency. These multiple frequencies are called "harmonics," and when radiated are classed

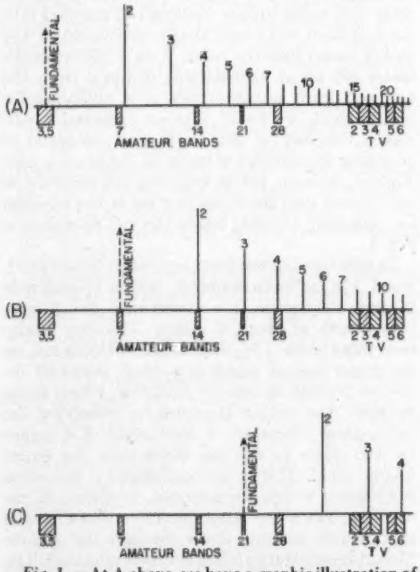

Fig. 1 — At A above, we have a graphic illustration of an 80-meter fundamental signal shown by the dotted line, and to the right the harmonics, gradually getting weaker as the frequency increases. At B, we see the increase in harmonic strength in the TV band when the fundamental is moved up to 40 meters, while at C, the low-order harmonics of the 15-meter fundamental are much greater in amplitude than those from either 80 or 40 meters. In actual practice, the harmonics may not have the relative strengths shown, but this drawing gives a rough idea of what takes place.

* Technical Assistant, *QST*.

as "spurious" — that is, unnecessary and unwanted — emissions. It is these harmonics that can cause TVI when they happen to fall in a TV channel.

To obtain a clear picture of harmonics and their relation to TV, let's for a moment look at Fig. 1. In Fig. 1A, we see the amateur bands and the TV channels represented along a horizontal line. Rising above the line, at 3700 kc., is a vertical line representing the fundamental signal. At twice the frequency, 7400 kc., we find another vertical line which represents the second harmonic. Each harmonic is shown in this manner as we go higher in frequency. In a rough way, the length of each line represents the amplitude of the harmonic, so it is apparent as we go higher that the harmonics get weaker. (Although we only show harmonics through Channel 6, they will also extend up into the higher channels, 7 through 13. However, we seldom need to concern ourselves with these higher channels because the harmonics become so weak that it is a rare case when harmonics from 80 or 40 meters cause interference.)

Now, looking at Fig. 1B, we see what happens to the harmonics when the transmitter is in the 7-Mc. band. Observe that the harmonics in the TV range are considerably stronger. And if we look at Fig. 1C, with the transmitter operating in the 21-Mc. band, we find we have really strong harmonics falling in the TV Channels 3 and 6. It becomes very apparent that the lower the "order," or number, of the harmonic, the stronger it will be. In other words, harmonics from an 80-meter signal are less likely to interfere than those from a 40-meter, or 15-meter one. If we can visualize a TV signal in Channel 3 having a strength equal to one-half inch on this scale, we'll see some startling results. On 80 meters, the harmonic in Channel 3 is a high one and is considerably weaker than the TV signal. The same is true of the 40-meter harmonic. However, on 15 meters, the third harmonic now falls in Channel 3 and it will be practically as strong as the TV signal. Harmonics as low as the third and fourth can be tough to handle, even in an area where there is a strong TV signal.

This brings up another point when considering harmonic interference — the strength of the TV signal being received. It is quite possible to have a harmonic in a given TV channel and not cause TVI simply because the TV signal is strong enough to override the harmonic. So it is apparent that the stronger the TV signal the less the problem we have with TVI. Probably the answer is for the ham to move next door to the TV station! Unfortunately, that isn't always feasible, so the next best thing is to try to get the strongest possible TV signal to work with. It can be pointed out to your neighbor that if he has a good antenna system, he'll not only get less interference, he'll also have a much clearer picture to watch. When you talk to him about a better antenna, pass along the information that such things as spark-plug interference also will be a great deal weaker, and in many cases disappear. This is particularly true in weak-signal areas.

We could spend considerable time in this article explaining how to suppress harmonics, but the reader would profit more by studying the chapter on BCI and TVI in *The Radio Amateur's Handbook*. All phases of interference and its cure are treated in more detail than would be possible in this space. It can be pointed out, however, that usually only a minimum of shielding and filtering in a transmitter is necessary to eliminate harmonic interference from 80- and

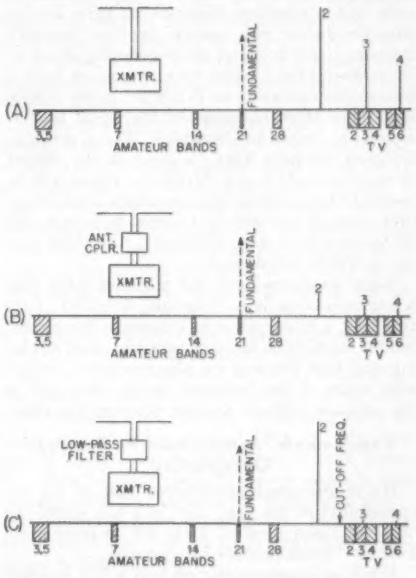

Fig. 2 — **What happens with two methods of attenuating harmonics. At A, we have just the transmitter and antenna. When an antenna coupler is used (B), the amplitudes of all harmonics are sharply reduced with a low-pass filter (C). Harmonics above the filter's cut-off frequency are greatly attenuated but those harmonics below the cut-off frequency are not affected.**

40-meter operation. In the case of 15-meter work, good shielding, lead filtering, and a low-pass filter at the transmitter output will be needed to do a good job. An antenna coupler frequently will provide all the harmonic attenuation needed to clean up interference. In some cases, a low-pass filter may be needed in addition.

Fig. 2 illustrates the difference between an antenna coupler and a low-pass filter. Fig. 2A shows a 21-Mc. fundamental and the harmonics that fall in Channels 3 and 6, as they might be if the transmitter were fed directly to the antenna. Fig. 2B shows what happens when an antenna coupler is used between the transmitter and the antenna. You will note that the harmonics are sharply reduced in strength. Aside from TV, harmonics can get you into trouble if they should interfere with any other service, and an antenna

coupler reduces the strength of all harmonics, whether they fall in the TV range or not. Now, in Fig. 2C, we show what happens when you employ a low-pass filter between the rig and the antenna. In this case, all the signals lower than the filter's cut-off frequency of 45 Mc. are passed through without attenuation. Those harmonics above the cut-off frequency are sharply attenuated.

Low-Pass Filters

Many newcomers hear the term "low-pass filter" and don't know exactly what is meant. A low-pass filter is simply a combination of coils and condensers designed to pass all frequencies below one known as the "cut-off" frequency and to reject all frequencies above it. To make it even clearer, let's assume we have a transmitter operating on 21,100 kc. in the Novice band. The third harmonic of the signal falls at 63,300 kc., smack in Channel 3. With a properly designed low-pass filter installed at the output of the transmitter, our 21,100-kc. signal will be passed to the antenna without attenuation. However, because the filter is designed to have a cut-off frequency at, say, 45,000 kc., the third harmonic will be attenuated.

Some amateurs have the mistaken idea that a low-pass filter is a "cure-all" for TVI. It is true that a filter will help attenuate harmonics, but for the filter to function properly, good shielding and lead filtering are also necessary. Otherwise, some of the harmonic energy may get to the antenna without passing through the filter.

Fundamental Interference — Receiver Overloading

We've discussed interference that is the responsibility of the ham, now let's talk about the other common form of TVI, TV receiver overload, or "fundamental" interference.

When an amateur station and a TV receiver are close to each other — usually less than 100 yards [1] — it is possible for the receiver to be interfered with by r.f. from the ham's fundamental signal. Even though the amateur is transmitting a signal on his fundamental frequency and no other, interference is likely to occur if the receiver selectivity is inadequate. The amateur is not responsible for poor receiver design and is not to blame for this type of interference, although it sometimes is a little difficult to convince the TV owner of that fact.

It must be remembered that the average TV owner hasn't the vaguest idea of how a TV receiver works. He knows that he has paid a lot of money for his set and feels that he shouldn't get interference. He also thinks that he only gets interference when the amateur is operating his station. Before getting into any discussions with the TV owner, you must be positive that you are not radiating harmonics and that the interference is the receiver's fault. About the only sure method of determining whether or not your rig is clean is to make a test with your own TV set, if you happen to have one. If not, try to borrow a receiver to make a test.

Assuming you have a TV set, you are now ready to determine what kind of TVI you have, if any. If interference is present only on channels having a direct harmonic relationship with your fundamental signal, then the trouble might be purely harmonic. You would know for sure that interference was fundamental overloading if you had trouble on channels that *did not* have harmonic relationship, but harmonics from the Novice 40-meter band hit every channel. This is also true of 80 meters. In the case of 15 meters, the only harmonics to interfere would be the 3rd in Channel 3 and the 4th in Channel 6. In such a spot you could look for fundamental overloading on Channels 2, 4, and 5. Observing interference on channels where there is no station won't be of any help as there is no sure-fire method of getting conclusive results.

The best method of making sure the receiver won't be troubled by fundamental overloading is to use a high-pass filter.

High-Pass Filter

We've already discussed what a *low*-pass filter is and how it works when used on a transmitter. A *high*-pass filter is designed to pass all

[1] It is possible to have this type of interference at longer distances but usually only on receivers manufactured prior to 1949.

Here is a case where a TV set doesn't have enough rejection to keep out a fundamental short-wave signal. As can be seen, the TV set is rather unhappy about the whole thing.

TV channels without attenuation while attenuating any frequencies lower than its cut-off frequency, usually around 40 Mc. Thus, a high-pass filter will keep your fundamental signal out of the TV receiver.

For a high-pass filter to work properly, it should be installed as close as possible to the antenna input of the TV receiver. By close, we don't mean on the back of the set. In most TV receivers there is a short length of 300-ohm line that connects the external antenna terminals to the tuner. This length of line is long enough to pick up considerable r.f., so to avoid pick-up of this kind be sure the filter is mounted right at the tuner. Before purchasing a high-pass filter, check to find if the TV receiver you have already has one built in. Many of the late model sets have built-in filters.

If you interfere with a receiver which has a high-pass filter, you'd better look for harmonic trouble in your rig. Experience has it that when interference is present on a receiver with a properly installed filter, the trouble is usually harmonics.

Once you are sure that your rig is clean — and your own TV set is the best witness you have — then it is time to talk to your neighbor about his troubles. It should be pointed out to the TV owner that you're not having trouble with your set, so it might be possible his set is not properly filtered. It should also be pointed out that the amateur is in no way responsible for interference in poorly designed TV sets, and that the TV owner would be well-advised to have a reliable serviceman install a high-pass filter. Experience has proven that it is much better for all concerned for the ham to adopt a "hands off" attitude with respect to the neighbor's set. What the amateur *can* do is explain to the serviceman exactly why the TV set is being interfered with an how it can be cured.

Most TV receiver manufacturers have a policy of reimbursing the serviceman for the cost of the high-pass filter installation. If there is a TVI committee in your area, the complaint should be referred to the committee. Not only do its members have the necessary "know-how," in addition, the FCC will approve the committee's recommendations for a filter installation to the receiver manufacturer.

• Ask an aspiring amateur fifteen years ago what his biggest problem was, and he would probably reply, "Getting a license. After that I will be all set." Ask the same question today and you might hear, "Well, getting a license isn't much of a problem, but the threat of TVI worries me a lot." While one can't disregard the threat of TVI these days, there is no need to let it make your life miserable, as W1ICP points out in this article.

In places where a TVI committee is not functioning, a serviceman may be reluctant to install a filter free of charge because he feels he won't be reimbursed by the manufacturer. In such a case, it may be necessary to persuade the set owner to write and explain the situation to the manufacturer. Another method of getting results would be for the amateur involved to write to his regional FCC office. The FCC should be informed of all the steps the amateur has taken and it should be pointed out that the interference is no doubt due to fundamental overload.

As we said earlier, the BCI-TVI chapter in *The Radio Amateur's Handbook* should be carefully studied. Also, ARRL Headquarters has many printed helps on TVI that are available free of charge. These helps include such items as sample letters to the TV owner showing him his responsibility, samples of newspaper publicity, information on forming TVI committees, and several other pieces of printed matter designed to help the ham.

In addition, Phil Rand, W1DBM, has published an excellent book on TVI.[2] Spend a few evenings reading this material. You'll be well equipped to handle the problem of TVI when you encounter it.

[2] Send request and 25 cents in coin to cover cost of mailing to: Miss Anne Smith, Remington Rand, Inc., 315 Fourth Ave., New York 10, N. Y.

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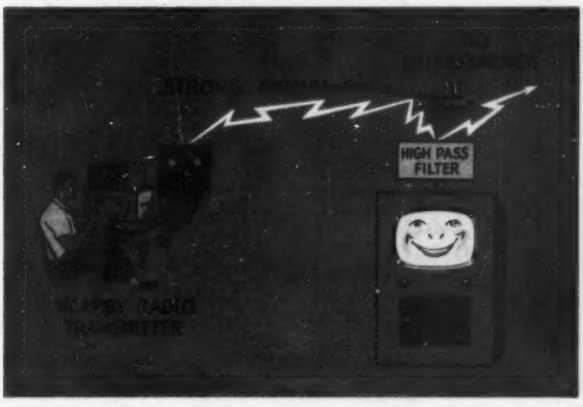


Everybody's smiling again; the high-pass filter keeps out the fundamental signal and hence — no interference.

♦

A Switchable Multiband Ground-Plane Antenna

Making One Antenna Do the Work of Three

BY FRED J. MERRY,* W2DSU

• Here is a three-band system that uses a minimum of real estate, has good DX properties, and is fed with low-impedance line. If that doesn't solve the antenna problems of a lot of amateurs, our spies have the situation all wrong.

THE horizontal antenna will give a fair performance on several harmonically-related amateur bands. However, the directional characteristics change from one band to another and the coupling conditions to the final amplifier usually vary between bands. In addition, it does not always deliver the low angle of radiation that is so desirable for DX work on 20, 15 and 10 meters. With multiband rotary beams on these bands, it is hard to get complete flexibility, and there are many constructional and switching problems that go with multiband beams. So, what about a simple, easily-fed nondirectional multiband antenna with reasonably good low-angle radiation, just in case DX comes back in 1956? One answer, at least, is a switchable vertical ground-plane type fed with 50-ohm coax line. We have used such an antenna for the past four years and, while it has been recently dismantled, we do not hesitate to recommend it to the gang.

A ground-plane antenna with switches to change the electrical length of the vertical element is fairly easy to construct and will give a good account of itself on DX as well as local work. Numerous tests made between this antenna and good 3-element 10-meter and 2-element 20-meter beams have indicated that the ground plane averages about one S-point less than the beams, combining the results over various skip conditions. However, compared with beams that fail to produce low-angle radiation, the ground plane is very apt to excel on DX work. The only disadvantages we have encountered are a rather high receiving noise level compared to the beams and, of course a tendency to blanket any susceptible a.c./d.c

*East Greenbush, N. Y.

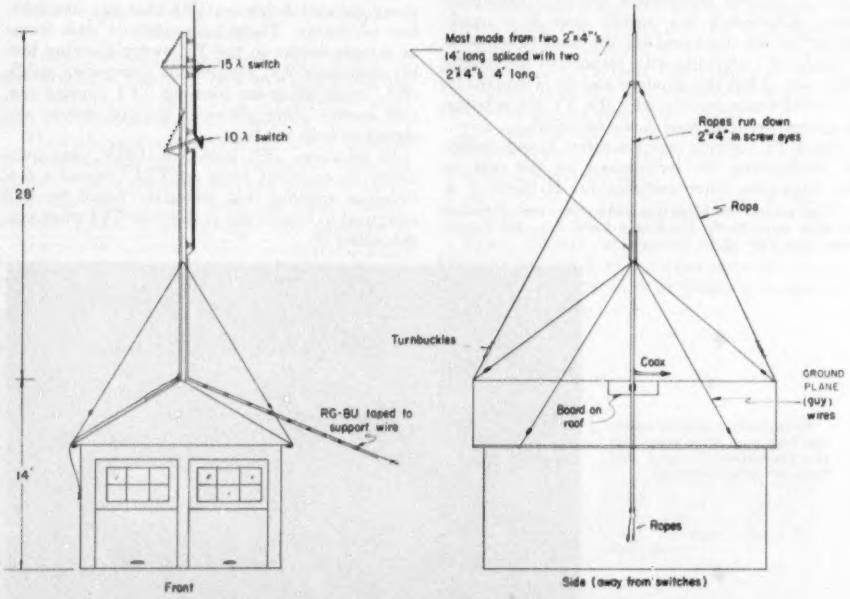


Fig. 1 — The three-band ground-plane antenna at W2DSU was mounted on top of the garage. A 28-foot-long support of 2 by 4s held the radiator and switches in place and supported the top whip section.

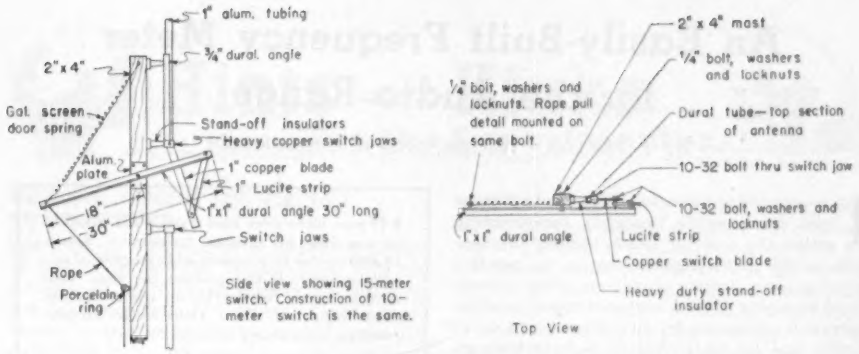


Fig. 2 — Two views of one of the bandswitches. W2DSU suggests that a rope return would be more reliable than the spring, although this might depend upon the construction.

broadcast receivers owned by folks in the neighborhood.

The constructional details are shown in Figs. 1 and 2. The antenna was mounted on the garage roof in back of the house, with the coax feed line suspended from the base of the 28-foot 2 by 4 mast to the upper portion of a window frame on the rear of the house. Other designs equally good may suggest themselves. Other combinations such as a 40/20 job are obviously possible. The fact that the ground-plane wires are longer than a quarter wave on the higher-frequency bands does not seem to disturb the s.w.r. or radiation characteristics appreciably. It would be a good plan to use a second rope pull on each switch instead of a spring return. The switches are a long way up if they should happen to stick. (We found this out the hard way.)

The log shows hundreds of DX stations worked with this antenna from W2DSU. WAC on 14 Mc. has been made on c.w. in 26 minutes during a DX test. While there is nothing spectacular anymore in these results, they do prove that the flexibility obtained with switches in the vertical element of a ground-plane antenna is not offset by any noticeable difference in performance.

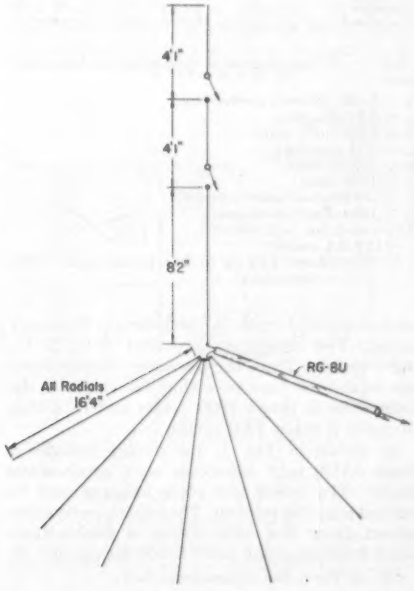


Fig. 3 — The electrical circuit of the multiband ground-plane antenna.

An Easily-Built Frequency Meter for the Audio Range

BY J. TAYLOR,* W2OZH, AND H. BREDEMEIER *

• If you have ever had a need for quickly measuring an audio frequency below 10,000 cycles to a reasonable degree of accuracy, here is the gadget for you. You couldn't ask for anything more simple and foolproof than this little direct-reading frequency meter.

In recent years there has been an increasing need for accurate frequency measurement within the amateur bands. Among the reasons for this increasing need are: (a) the rapidly-growing concentration of stations within certain band segments, (b) the increased use of network operation occasioned by civil defense and other traffic, and (c) the advent of s.s.b. techniques.

The circuit presented here provides in a very simple manner a sufficiently accurate comparison of frequencies for normal network and single-sideband activities. It is the function of this circuit to provide a linear indication on a calibrated meter of the heterodyne beat frequency existing at the output of any normal communications receiver. Thus, by use of this simple instrument, the procedure of manually adjusting a standard frequency meter to zero beat is replaced by a direct reading on a meter dial of frequency

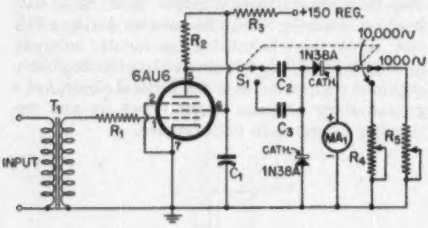


Fig. 1 — Wiring diagram of the simple beat-frequency meter.
C_1 — 8-μfd. 250-volt electrolytic.
C_2 — 0.01-μfd. mica.
C_3 — 0.0011-μfd. mica.
R_1 — 0.51 megohm.
R_2 — 10,000 ohms.
R_3 — 1000 ohms.
R_4 — 10,000-ohm potentiometer.
R_5 — 1000-ohm potentiometer.
MA_1 — 0–1-ma. milliammeter.
S_1 — D.p.d.t. switch.
T_1 — Microphone, pick-up or line to one grid (UTC 0-1 or equivalent).

error compared with a preselected frequency setting. Two ranges are provided: 0 to 10 kc. and 0 to 1 kc. Thus, the frequency displacement can readily be read to within 100 cycles if the heterodyne is above 1000 cycles and to within 10 cycles if below 1000 cycles.

As shown in Fig. 1, the circuit includes a single 6AU6 tube connected as a square-wave limiter. The heater and plate voltages may be derived from the receiver. The square-wave audio output from this tube drives a double-diode counter circuit using two 1N38A germanium diodes that provide sufficient current to operate the 0-to-1 milliammeter. Calibration adjustment for the full-scale readings of 10,000 cycles and 1000 cycles are by means of variable shunts R_4 and R_5, which may then be replaced by fixed resistors. The adjustment holds for long periods of time and the meter calibration below the full-scale values is quite linear. Either the 500-ohm or the 8-ohm output-transformer tap on a communications receiver is satisfactory for the input signal to the circuit. The entire circuit can be housed in a small inclined-front meter cabinet.

For those unfamiliar with a "counter" circuit, a little study of Fig. 1 may be in order. A sine-wave signal of any frequency (and of any amplitude above the limiting threshold) appears in the output of the 6AU6 as a constant-amplitude square wave. This square-wave voltage is applied to C_2 (or C_3, depending upon the range in use). Charging current to the condenser is carried in one direction by the lower diode — in the other direction the charging current passes through the meter and upper diode. The indicated current is proportional to the frequency (*number* of cycles per second — hence the name "counter"), to the accuracy with which the capacity of the condenser, and the amplitude of the square wave, remain constant. It is only necessary to calibrate the meter at 1 kc. and at 10 kc. to have accurate readings throughout the scale without further calibration.

When the meter is used to measure the frequency error of a network station, the receiver is first tuned to zero beat with the frequency standard (or a station known to be on the correct frequency). The off-frequency station will give an audible beat that can be measured by the meter (in the absence of other signals). Whether the off-frequency station is higher or lower must be determined, of course, by retuning the receiver to zero beat with the signal being measured. If the frequency standard is one with signals at 10-kc. intervals, the usual care must be exercised to make certain which of the standard signals is beating against the signal being measured. The receiver selectivity is usually used to reject the undesired standard signals.

*M. ten Bosch, Inc., Pleasantville, N. Y.

Hints and Kinks For the Experimenter

CONTROL CIRCUIT FOR VIKING I TRANSMITTERS

THE Viking I transmitter as assembled by the factory, or as wired in accordance with kit instructions, is made to operate by throwing the panel-mounted plate switch. There are no means for microphone-button control of the rig and there is no provision for either antenna change-over or disabling of the receiver during transmitting periods. However, all of these convenient operating aids can easily be added to the transmitter by installing the simple control circuit shown in Fig. 1.

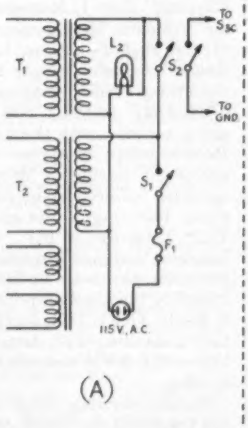
Section A of the diagram is the original control circuit for the Viking I and Section B of the drawing shows the modified arrangement. Notice that the revised layout employs K_1 as the main control and that the original control switch, S_2, of the Viking schematic, is used as the relay control switch. Incidentally, only one side of S_2 is used in the new circuit. K_2 is used as the antenna change-over relay and can be used for disabling of the receiver in some installations. Power, 6 volts d.c., for the relays is obtained from a small supply consisting of T_3, CR and C_1. Incidentally, 6-volt relays were selected to reduce the hazards of higher voltages on the microphone switch.

Attention should be called to the receiver-disabling contacts of K_2. Notice that one of the contacts is wired to Pin 4 of the 8-prong socket located at the rear of the Viking transmitter. Since Pin 4 is unused in the original circuit, it was used in the modification as part of the receiver-disabling circuit. A Hallicrafters model S-76 receiver is used here at WØNMN and this set has Pin 4 of the power socket, SO_3, connected to the receive/stand-by switch. To complete the circuit between the receiver and the transmitter, two 8-pin male plugs were tied together with Pin 1 to Pin 1 and Pin 4 to Pin 4. Pins 6 and 7 at the receiver end of the cable were shorted with bus wire. Plug PL_2 (normally used in a.c. operation) is removed from the receiver and the new cable is plugged in its place. The other end of the cable fits into the socket at the rear of the Viking. Accidental reversal of this cable will only result in an inoperative receiver since Pins 6 and 7 on the receiver end complete the a.c. heater circuit for the S-76. This error will have no effect on the transmitter since Pin 6 on the transmitter socket is not used. However, to eliminate the possibility of error, the plugs were color-coded to their respective sockets. — *Lawrence F. Caccomo, WØNMN*

SUPPRESSION OF GENERATOR WHINE

MANY cases of generator whine may be suppressed or eliminated merely by adding a coil and a capacitor to the generator circuit. The coil, close-wound with 20 turns of No. 12 enameled wire and having a diameter of ¾ inch, should be inserted in series with the generator output lead right at the output terminal of the

(Continued on page 138)



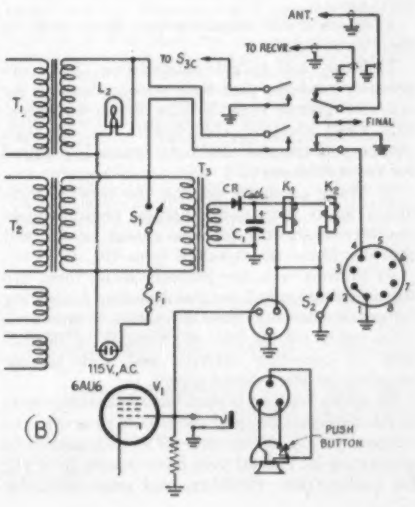


Fig. 1 — Control circuit for Viking I transmitters.

C_1 — 2000-μfd. 15-volt electrolytic.
CR — 500-ma. selenium rectifier.
K_1 — D.p.s.t. 6-volt relay.
K_2 — Coaxial antenna relay with s.p.s.t. receiver disabling contacts.
T_3 — 6.3-volt filament transformer.

NOTE: All other components are original parts of Viking transmitter.

Happenings of the Month

LICENSE MATTERS

For quite some time now, the amateur licensing unit at FCC has been fighting a losing battle with the heavy flow of license applications, and has been as long as three months behind in its work. When this delay is added to a further loss of several weeks which sometimes occurs in the processing of applications by the district offices, the result is an interminable wait on the part of eager newcomers for the ticket authorizing them to go on the air.

This situation has recently been considerably improved by Congressional expansion of FCC funds in the fiscal year beginning July 1st, some of which were specifically earmarked as extra for the Safety & Special Services Bureau in order to bring licensing more up to date. A number of temporary workers in the amateur licensing unit have done wonders with the backlog, and it is expected by the time you read this licensing will be only the customary 30 days behind receipt of applications at Washington. It is true that much of this progress has been at the expense of letting modification and renewal applications slide a bit, but it is hoped that these will be similarly brought up to date before long.

In many instances, individual delays are not FCC's fault. The licensing unit finds a number of common errors in the applications we file. Such applications must be returned for correction, and then go through the whole process all over again when they are refiled. As a warning, we call your attention to the following typical mistakes:

1) Quite a few amateurs put down 1953 as their birth date.

2) Many fail to get notarization. They apparently read the part that says application for operator license doesn't have to be notarized. But most amateur applications are for both station and operator, and notarization is required for the station part.

3) Many amateurs use the new renewal form 405-A when they have changed circumstances one way or another (such as change of address) and should use the standard form 610.

4) Persons who are properly using form 610 for modification but are simultaneously applying for renewal because their expiration is imminent often fail to fill out item 11, which is an affirmation of operating activity and code ability required for the renewal aspect.

5) As an additional item, many amateurs send in for modifications and the license runs into the renewal period by the time FCC gets around to processing it. Should you have reason to apply for modification, therefore, and your expiration date is only two or three months away, apply simultaneously for both modification and renewal.

GENERAL CLASS EXAM CHANGED

Now that former "restricted" voice bands are available to General and Conditional Class licensees, FCC has augmented the scope of the examination material by the addition of questions relating mostly to radiotelephone operation. A new edition of the *License Manual* now being distributed contains the necessary information. Those persons now using the Thirtieth Edition of the *Manual* can prepare themselves for the increased scope by attention to the following questions (now in the Extra Class chapter) appearing on pages 43–53: 150, 161, 183, 241, 247, 250, 256, 258, 264, and 267.

NATIONAL CONVENTION

Approximately a thousand hams and XYLs, from all over the world, attended the 7th ARRL National Convention in Houston, Texas, July 9th–12th.

The Convention unofficially got under way Thursday night with an informal barbecue, and officially opened Friday morning, July 10th, with the keynote address being made by George Sterling, W3DF, of the Federal Communications Commission. Technical sessions were held throughout the day — E. W. Pappenfus of the Collins Radio Company on "Pi Networks and the Elimination of TVI"; Don Simon of RCA on "Transistors"; C. V. Clark of KXYZ on "Speech Clipping"; John L. Reinartz of Eitel-McCullough on "Antenna Measurements"; Arthur H. Lince of the Bell Telephone Labs on "Microwave Relay." A buffet supper and dancing featured the Friday evening program.

Saturday morning was devoted to special group sessions, with the v.h.f. gang, the DXers, mobile group, teenagers, and communications group all having a number of outstanding speakers, followed by luncheons. Saturday afternoon, following a discussion of Conelrad by Ernie Tellerman of FCC, comprised the official League "business" meeting, chairmanned by President Goodwin L. Dosland, WØTSN, and including the usual open forum discussion. Philip S. Rand, ARRL Technical Consultant, presented his outstanding TVI demonstration. The grand ball and ROWH ceremony were held Saturday evening.

Sunday morning, West Gulf Director Middelton presented the Youth Award for his Division to Jack Bryant, W5TFB. Gerald R. Chinski of

George E. Sterling, W3DF, FCC Commissioner, delivers the keynote address at the 7th ARRL National Convention at Houston. *L. to r.*: President Dosland, WØTSN; West Gulf Division Director Middelton, W5CA (partially hidden by rostrum); Dr. Charles A. Fermaglich, W5FJF, Convention Chairman; Ed Bailey, W5SDA, Houston Amateur Radio Club prexy.

KXYZ reminisced on the Trans-Atlantic Tests of 1921; E. M. Shook described the famous Dallas Plan for TVI; G. A. Bradford of General Electric spoke on "Public Relations and the Amateur"; George Saylor gave a talk on amateur television. The Convention came to a grand climax Sunday afternoon with the formal banquet.

Adequate care was taken of the ladies, with features such as boat trips, luncheons, and teas.

MARITIME MOBILE FILING

The text of the comment filed with FCC by the League, in accord with instructions of the Executive Committee, concerning maritime mobile amateur privileges is as follows:

FEDERAL COMMUNICATIONS COMMISSION

In the Matter of

Petition of the Maritime Mobile Amateur Radio Club for amendment of Section 12.91(b) of Part 12, "Rules Governing Amateur Radio Service", to permit maritime mobile amateur radio stations to operate on frequencies in the band 21,000–21,450 kc. when outside the continental limits of the United States, its territories and possessions. } DOCKET 10501

COMMENTS OF THE

AMERICAN RADIO RELAY LEAGUE, INC.

These comments are filed pursuant to Paragraph 4 of the Notice of Proposed Rule Making dated May 15, 1953.

These comments are made pursuant to a policy of some years' standing of the Board of Directors of the American Radio Relay League, Inc. As the Commission is aware, the ARRL Board of Directors is composed of sixteen amateurs nominated and elected by approximately 39,000 licensed amateurs in the United States and possessions, to represent them in the formation of League policy.

I

As concerns the present specific proposal, the American Radio Relay League is of opinion, as it has been for several years past, after annual careful examination of the possibility of expanding amateur operating privileges for maritime mobile operation outside the continental limits of the United States, that the current international radio situation is such as to make such action highly inadvisable. The League does not believe it wise to take such action, and, therefore, requests the proposal be dismissed.

II

As concerns the general principle of privileges additional to the present ones for those amateurs operating maritime mobile, the League's Board is in favor of such action where such operation would not jeopardize basic amateur operating privileges. In this connection, it is recognized that on many of their trips, United States vessels operate only in the coastwise service. If expanded amateur maritime-mobile operating privileges could be restricted to coastal operation, the international objection would not arise; the League feels that, in such cases, there is no reason why all bands normally available for portable and mobile operation under the terms of § 12.91(a) should not be available for such operation. It is, therefore, the League's suggestion that in lieu of the proposed amendment of the rules, § 12.91(a) be amended to read as follows:

§ 12.91 *Requirements for portable and mobile operation.*

(a) Within the continental limits of the United States, its territories, or possessions, or on shipboard, when actually operating only between ports on the East, or between ports on the West, or between ports on the Gulf Coasts of the United States, or between ports on the East and Gulf Coasts, an amateur station may be operated as either a portable or a mobile station on any frequency authorized and available for the amateur radio service. Whenever portable operation is, or is likely to be, for an overall period in excess of 48 hours away from the fixed transmitter location designated in the station license, the licensee shall give prior written notice to the Engineer in Charge of the radio inspection district in which such portable operation is intended. This notice is required even though the station is, or is likely to be, operated during any part of this overall period at the fixed transmitter location. Whenever mobile operation is, or is likely to be, for a period in excess of 48 hours without return to the fixed transmitter location designated in the station license, the licensee shall give prior written notice to the Engineer in Charge of the radio inspection district in which such mobile operation is intended. The notice required for either portable or mobile operation shall state the station call sign, the name of the licensee, the date or dates of proposed operation and the contemplated portable station locations, or mobile station itinerary, as specifically as possible. Additional advance written notice shall also be given in accordance with the foregoing whenever such operation away from the fixed station location designated in the station license exceeds one month, and for each additional month of such operation.

III

In view of the complex character of the problems now presented and constituting the basis of the League's request for dismissal of the proposal,

The American Radio Relay League, Inc., requests oral argument.

AMERICAN RADIO RELAY LEAGUE, INC.
By: PAUL M. SEGAL
General Counsel

A. L. BUDLONG
General Manager
July 30, 1953

Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

PARAKEETICS

11109 S. Hoyne Ave.
Chicago 43, Ill.

Editor, *QST:*

The scurrilous attack on parakeets in July *QST* (p. 55) will no doubt arouse a storm of protest from all true bird lovers. Perhaps the difficulty VE3DQX's pet is having with the crystal filter is not the bird's fault at all. Has VE3DQX checked the shaft alignment on the phasing control since the last time the receiver fell off the bench?

My Sam had a little difficulty with my slide rule, but I didn't find it necessary to jump off the deep end, and impugn the intelligence of my little feathered friend! A little checking indicated that my rule was not in good condition, so I replaced it with one of the circular type, installed a ball-race in place of the original bearing and purchased a small pair of rubber boots for Sam, to reduce his coefficient of friction. Needless to say, this cured the trouble, and he now whips out those single-layer inductance values eight to the bar.

If VE3DQX values brute strength above intellectual capacity, I think he would be happier with a small horse.

— *Frank B. Andrews, W9BTC*

CALLING FREQUENCIES

3632 Jones Street
Sioux City, Iowa

Editor, *QST:*

I am not from Missouri but I live close enough to that "show me" state that there are some things that I will not take for granted. One of these things for which I would like some proof is that a calling frequency on the 75-meter 'phone band in the daytime will not work out. I believe that if the calling frequency for this band were at either end of the band, say at 3995 kc. or 3805 kc., and that we applied the conditions to it that the FCC embodied in their proposal, and that if we used it just from eight o'clock in the morning until five o'clock in the afternoon, and if it were optional, and if ARRL Headquarters would put about one tenth of the effort and space in *QST* in promoting this calling frequency that they do in selling single sideband, then it would work out and work out wonderfully well.

— *Elmer E. Hansen, WØAF*

CHERCHEZ LA TVI

2, rue Stanislas Baudry
Nantes, Loire-Inferieure

Editor, *QST:*

It was with considerable interest, together with a growing sentiment of melancholy, that I read, in the January issue of *QST*, the article of Mr. Mack Seybold, "Harmonic Radiation from External Nonlinear Systems." At first, I strongly suspected the author of being a close relative of Mr. Larson E. Rapp, but further development of the subject brought me to the conclusion that Mr. Seybold was a very serious gentleman, and certainly not kidding.

Well, then, if we poor hams now have got to suspect corroded kitchen sinks, bathtub drain-link mechanisms, junior op's crystal sets, stove pokers hanging from pipes, Grandpa's loose false teeth, Cousin Herbert's squeaking iron game leg, Aunt Annie's tarnished brass ear trumpet, oxidated aluminum saucepans in contact, and all other minor nonlinear systems in creation, capable of being TVI generators, I'm afraid that we had better shut down ham radio for good, and switch to less touchy hobbies such as tulip growing or muffler knitting.

Frankly, how can we be expected to clean up such wild varieties of trouble without starting most nasty complications? You just tell an angry complaining TV set owner that, in a direct attempt to cure the trouble, you must have a look at the aforementioned natural rectifying systems, and you'll promptly find yourself tucked in a straitjacket, gagged, and alertly watched by nice comprehensive folks in white dresses . . . a quite desperate situation from which recovery is impossible! And that will be the end of you.

However, until such an unpleasantness happens to many of us, maybe we could try to use the phenomenon? And, to begin with: Has a conveniently-corroded and possibly choked-up three-direction manifold got any chance to work nicely as a balanced modulator?

— *Andre Jacquet, F9OL*

TNX QSL

4 Sylvester St.
Portsmouth, N. H.

Editor, *QST:*

About six weeks ago I started asking each station that I worked if they would care to send a QSL card to my neighbor's little six-year-old daughter, Joan Foley. It was explained to them that she had recently been run over by a truck, which resulted in the loss of a foot and part of her leg. . . .

After explaining what I was trying to do, at our local club, the gang voted unanimously to adopt Joan as our club mascot. We have given her a life membership and intend to send her little gifts on various occasions. She has received many cards and some of the fellows have sent books and games, etc., in addition to their QSL card. . . .

— *John C. Barry, W1POK*

DOWN TO EARTH

941 Sunbury Street
Los Angeles 15, Calif.

Editor, *QST:*

Lower-frequency verticals are getting to be a fad nowadays and, among other things, there was recently an article, "The Truth About Verticals." Not that I wish to take issue with the author. I just want to add a few truths.

I have had a 75-meter vertical for about a year in a noisy location. When I tried to measure the impedance at the junction of the radials and the antenna, the noise and a near-by broadcast third harmonic drove the Antennascope meter off scale before the r.f. was coupled in from one of Mr. Millen's g.d.o.s. The two currents then battled back and forth, with the scope indicating reactance at all frequencies. Resistance reading, an improbable value.

The neighbors' — and the XYL's — b.c. sets seem to get me 40/9, local scale. But not so very many hams do. Some mobiles do, and tell me to get off the "mobile frequency," which I suppose is a spot reserved on their tickets and mine. Can't seem to find the writing, but anyway . . . besides the antenna picking up all the noise in this rather downtown QTH, there is the fact that the radials are spread out all over three back-yards, one mine. A fellow wrote an article on how to abbreviate a 75-foot Marconi, but his remedy was in the height. I don't care so much about getting in the sparrows' way — it's that 140x140 horizontal area. And the QSB on local contacts with horizontal antenna rigs!

So down comes my 80-foot neighborhood landmark.

— *Ralph Stewart, W6KIR*

HAM ASSISTANCE

Eureka Sound Weather Station
N.W.T., Canada

Editor, *QST:*

I wish to thank the League's Communications Department and Stan, W9ZZ, for their assistance in procuring me my present job with the U. S. Weather Bureau; the League through W1AW and its official bulletin announcing the opening back in the middle of March, and Stan, W9ZZ, for his kind and able assistance in directing me to the proper authorities.

— *Richard I. Little, W8GML*

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

The number of women in engineering work is increasing. Those who do enter the various professional fields usually are glad that they did, and they do well at their jobs.

Specifically, we find more and more women in the field of electronics. Girls are encouraged to enter engineering if they show an aptitude for the work. Often this aptitude manifests itself early in life — a girl is particularly interested in the "how" and "why" of things — she likes to investigate and experiment and solve problems through intelligent thinking.

For such a girl, amateur radio is obviously an ideal hobby. The story of Jane Hodgson, W4MKP, exemplifies this observation.

Long interested in model airplanes and radio control, at thirteen Jane realized that an amateur license would allow her to do more of the type of thing she wanted to do — build and experiment. After getting her first license with virtually no aid from anyone, she soon worked toward her commercial First Class Radiotelephone operator's license and at fifteen became an engineer-announcer at a Miami broadcast station. The knowledge and experience gained through amateur radio enabled her to make transmitter adjustments and repairs by herself. Her work was so satisfactory that she remained at the station for two years (summers and after school hours) and thereby earned enough money to put herself through college. Today, at nineteen, she is entering her junior year at M.I.T., where she is majoring in Electrical Engineering; and she has her sights set for a job in electronics.

The second YL to get an Extra Class license, so far as we know, W4MKP operates 20, 40 and 80 c.w., using only gear which she has built herself — receiver, and even coils, included. She is shown here aligning her superhet. (*Photograph courtesy Prof. S. A. Coons, M.I.T.*)

Jane feels that "amateur radio offers an excellent opportunity for the engineer (or experimenter) to try out his ideas at nominal cost, with disregard for age, education or 'company sanction.' It gives young people an opportunity to investigate radio and electronics and to deter-

(*Continued on page 138*)

* YL Editor, *QST*. Please send all contributions to W1QON's home QTH: 318 Fisher St., Walpole, Mass.

Twenty of the twenty-six YLs who attended the 1952 ARRL National Convention at Houston are shown gathered together here following the YL Breakfast. Girls attending were: W1RYJ, W3MSU, W4s TIE UDQ VGO VKL WTJ, W5s BKG DEW DRA DUR EUG PDU PKL PWN RYX QXR SPV TYX UJD UUS WTX YCV, W8s BFQ FPT, and WØLHP.

• Technical Topics —

Re Ham-Band Transmitting Loops

In the June issue of *QST*, under "Technical Topics," we considered the theoretical aspects of why a loop or magnetic dipole is a radiator. In the original article, and in the June discussion, we mentioned the relative importance of the ohmic losses in the wire of the loop, and in the "transducer" or tuned circuit used. We can readily estimate that relative importance, and the over-all loop efficiency, as well as determine measures to be taken to improve that efficiency, by writing the conventional loop radiation-resistance equation, and then rewriting it.

First, let us consider the meaning of radiation resistance. It is simply the resistive component of the impedance measured at the antenna terminals *if* a very good Antennascope or impedance bridge is used for the measurement *and if* the wire used has no resistance and all connections are lossless. The latter is not true for any antenna. But, if the radiation resistance is high enough, that is, if the antenna radiates "easily" and, if the ohmic losses are small enough, an antenna's efficiency is very high. For example, a half-wavelength dipole at 40 meters, of No. 12 wire, is about 98 per cent efficient. Radiation resistance is a measure then of the amount of antenna current required to consume a watt of *radiated* power, rather than *heat* power, as in the case of a carbon resistor.

The equation telling us how easily a loop radiates is, from Terman:

$R_r = 31{,}200(NA/\lambda^2)^2$, where A is the loop area and N the number of turns in the loop.

For the loop as described by W4LW, A is approximately 9 square feet, and λ, the wavelength, is 141 feet at 7 Mc. The radiation resistance is only 0.0063 ohm — a very small value for even a small antenna. For example, the radiation resistance of mobile 75-meter antennas is from 0.3 to 1.2 ohms, depending on length and loading.

The small value of radiation resistance leads us to believe that the ohmic losses might be significant, so (assuming uniform current distribution) we calculate tLem from the *Federal Radio Telephone Handbook*, p. 87. The d.c. resistance of No. 12 wire is 0.00158 ohm per foot. And the *Federal Handbook* tells us that at 7 Mc. the a.c. resistance is about 20.66 times that. For our 12 feet of No. 12 wire we conclude that the ohmic loss is 0.389 ohm. The efficiency of the loop *itself*, not considering the transducer, is thus $0.0063/0.0063 + 0.389$, or about 1.6 per cent.

If we consider the lossy coil in the circuit, we can correct for its presence, *assuming all connections lossless*. Its loss resistance will be:

$2\pi fL/Q$ and, assuming a Q of even 400, the loss resistance is 0.275 ohm, lowering the efficiency from 1.6 per cent to 0.96 per cent.

Now, what can we do to improve the situation? Rewriting the Terman equation, we obtain:

$R_r = 1950\left(\frac{l_w}{\lambda}\right)^2\left(\frac{a}{\lambda}\right)^2$, where l_w is the amount of wire wound on the loop, and a is the loop diameter.

The ohmic loss resistance increases as the length of wire wound on the loop, but the radiation resistance increases as the square of that length, and also as the square of the loop diameter. Therefore, we conclude that we can improve the low efficiency of the original loop by increasing the loop diameter or increasing the length of wire wound on the loop. For example, for a loop 6 by 6 feet, and of 10 turns of No. 12 wire, one would calculate a radiation resistance of 10 ohms, and an ohmic loss resistance of 7.7 ohms for an over-all efficiency of 56 per cent — an improvement of 17.5 db. or almost three S-units.

Unfortunately, we note that we have wound some 240 feet of wire on this loop — almost two wavelengths — and, from helical antenna theory we suspect that the radiation-resistance equation is no longer quite valid. Nevertheless, we have been able to calculate the order of improvement obtained by an increase in loop wire length and area.

One might ask why such a low-efficiency loop works. The answer is simple. If W4LW were operating a transmitter of 100 watts output into this antenna, he would be radiating almost one watt, and one watt has tremendous capabilities. At 4 Mc., one watt will induce an S9 signal in a quarter-wave vertical at a distance of 16 miles, along ground of even poor conductivity, and be copiable at tremendous distances when traveling along the far less-lossy skywave paths.

— *J. J. Dougherty, Lieut. USN, W2LHB*

[Note: A similar discussion was submitted by J. S. Belrose, VE3BLW. Proceeding along slightly different lines, he arrives at essentially the same conclusion. — Ed.]

Quist Quiz

A is using "Rothman modulation" in his new rig and he occasionally gets reports of "It sounds like my receiver won't tune you in." This can become discouraging, and so he asks B for advice. B tells him not to worry, that some operators don't know how to handle their receivers. Is this answer good enough?

(Please turn to page 132 for the answer)

Annual Simulated Emergency Test

(October 3rd–4th)

ONCE each year the AREC conducts a gala demonstration and test exercise to try out our own emergency-communications facilities. This year the test is scheduled on October 3rd and 4th. During that week end, Red Cross stations W3PZA, W6CXO and W9DUA will be active on the National Calling and Emergency Frequencies to receive traffic destined to American National Red Cross in Washington, and special arrangements will exist for handling the many test messages addressed to ARRL and Civil Defense headquarters.

The dates are not mandatory — that is, exercises conducted within one or two weeks before or after the October 3rd–4th, week end can and will be counted as part of the Simulated Emergency Test provided they are properly reported by your EC. However, we urge the week end of October 3rd–4th be used if possible, since this will make a much more impressive national demonstration of amateur radio emergency communications potential.

Your EC, SEC, SCM and affiliated-club secretary have each received copies of a special bulletin outlining details on how to proceed. This bulletin was purposely mailed so that ECs would not receive it in time to make detailed plans for the test. We're supposed to be simulating an emergency. Every AREC organization should be at all times prepared to meet one. The SET is the annual test which demonstrates either the efficiency or shortcomings (or both) of the local plan.

If there is no EC appointed in your community, local amateurs should take steps to see that one is appointed. Meanwhile, why not get a group together and participate in the SET anyway? Let us know your plans and we'll rush you a copy of the bulletin. Even if this is received *after* the test, it will contain the necessary report forms so that your town or area will be listed in the write-up as being covered by amateur radio for emergency communication.

Here's a run-down of how the SET works:

1) The EC calls a surprise alert of his AREC organization some time during the week end of October 3rd–4th (or other date if more convenient).

2) The group conducts a simulated emergency test under the EC's direction. The test may be slanted toward natural disaster (with Red Cross participation if feasible) or civil defense (in coördination with local c. d. officials). During the test, each participant dispatches a message to the EC indicating his presence and availability, or anything else the EC directs.

3) The EC dispatches a message to ARRL Headquarters briefly describing the test and mentioning the calls of the participants.

4) The local Red Cross Disaster Chairman dispatches a message to the American National Red Cross in Washington, via amateur radio, reporting Red Cross participation in the test. This message will probably not be forthcoming unless it is solicited.

5) The local Civil Defense Director dispatches a message to his state Civil Defense Director, also via amateur radio, reporting civil defense participation in the test, if any. Again, the EC should solicit such a message. A list of state directors is included in the SET Bulletin.

6) After the test, the EC reports the details of his test on a form which we will provide for that purpose.

It is most important to our reputation as communicators that all messages be handled promptly and accurately, especially those destined to Red Cross and Federal Government agencies. A poorly-handled or long-delayed message does our reputation more harm than good, even if it is eventually delivered. We therefore call on all amateurs and organized traffic and emergency nets, when not occupied in their local test, to "turn to" in seeing that these messages are promptly and efficiently handled, *just as we would in a real national emergency.*

Amateur radio stations W3PZA, W6CXO and W9DUA, assisted by and operated by numerous local volunteer amateurs, will be activated and will be considered delivery points for any messages to the American National Red Cross. As in previous years, these stations will also assist in

(*Continued on page 110*)

He Makes What We Hams Use

LEON A. FABER, W9EH

The James Knights Company

SPARK COIL to single sideband, galena to superhet, bell-wire antenna to multiple beams, Lee Faber has traveled the route. A few years ago he was issued W9EH again, the call (without the W in front of it) with which he started the journey 37 years ago. Eight miles was his DX record before World War I, but for the last several years he's had a signal which to the gang QSOing Lee's former call of W9DAX as well as his present W9EH has meant "antennas." *QST*'s cover for October, 1950, carried a picture of the rotating 125-foot pole and its 10-meter beam. This arrangement has since been replaced with an 8-element stacked array on 10, while a 3-coaxial stack on 2 and a 3-element beam on 20 together with doublets on 40 and 75 keep it company. Although the two-towered set-up is a DX hound's dream and although Lee has worked more than 100 countries, a good rag-chew is always first choice; W9EH can be found on any of the 'phone bands from 3.9 Mc. to 144 Mc., usually in the middle of the day or in the late afternoon. The mike is used exclusively, possibly because of a reaction from early commercial brass pounding. Lee was one of the first to work 5 and 10 meters and at present is devoting a considerable part of h's operating time to s.s.b. It's no wonder that a call from W9EH is sure to result in an interesting QSO.

COMING A.R.R.L. CONVENTIONS

Oct. 9th–11th — Southwestern Division, Los Angeles, Calif.
Oct. 10th–11th — Midwest Division, Lincoln, Nebraska

(*Detailed announcements on page 32*)

Results, 19th ARRL DX Contest

NEVER experienced worse conditions during a contest." — *W4CYA*. . . . "Apparently the bands are at rock bottom." — *ZL1MQ*. . . . "Things went badly, but I've got some FB excuses." — *W8DUS*. . . . Other adjectival remonstrations re band conditions: "Spotty" — *KL7AON*. . . . "Poor" — *WØBBS*. . . . "Very poor" — *PAØSPR*. . . . "Bad" — *HB9AT*. . . . "Terrible" — *KG4AF*. Thus go the comments, practically ad infinitum. But DX men are hardy souls and, whatever the status of the ionosphere, rest assured they'll turn in some fancy scores. And that they did! There were 40 c.w. W/VE scores over 100,000 in 1953 compared with just 27 in 1952; the story is the same in the 'phone portions, with eight scores over 90,000 compared with only two last year. Honest, fellows, were conditions *really* so bad?

In accordance with contest rules, competition for awards was confined to participants in each ARRL mainland section and in each country outside the W/VE area from which qualifying entries were received. Certificates of Performance are being awarded to 66 c.w. and 54 'phone participants in the U. S. and Canada, and to 66 c.w. and 43 'phone entrants overseas. In addition, three multiple-operator stations and 25 club winners are receiving certificates.

The C.W. Section

Honors for the top W/VE score this year go to W2SAI, with W3BES at the helm. Shading all comers by a wide margin, Jerry piled up 320,829 points with 467 contacts and a multiplier of 229. Jerry's score is reminiscent of years when the ionosphere wasn't subjecting us to such shoddy treatment; not since the 1950 DX Test has a W/VE entrant tallied over 300,000. In 80 hours of brass-pounding, the famed W3BES operating prowess led to contacts with 96 different countries and easily earned the Southern New Jersey section award. The antenna lash-up at W2SAI was impressive. For 14 Mc.: three horizontal dipoles stacked at 30-foot intervals and backed by a "bedspring" plane reflector, all mounted on a 100-foot self-supporting and rotatable mast (see cover photo, September *QST*). Also available were ground-planes for 40 and 80, a 15-meter vertical, and a 3-element rotary for 10.

In the second spot was Eastern Pennsylvania section winner W3CTJ with 272,160 points, 432 QSOs, 210 multiplier. Maury's score, like that of W2SAI, helped considerably to swell the impressive total of the Frankford Radio Club. Maury used two finals, either a 304TL or p.p. 250THs, and a HRO-50-T receiver. Antennas included dipoles on 40 and 80, ground-planes for 40 and 80, and 3-element beams for 10, 15 and 20 meters.

A contact total of 404 and multiplier of 214 netted W4KFC third position. Virginia section winner, Vic was Potomac Valley Radio Club's contribution to the "top three" with his 258,512 points. The rig ran 1 kw. to p.p. 4-250As. Skywires were 2-element rotaries for 15 and 20, a 40-meter ground-plane, and an all-band long wire.

The following also scored over 100,000 points: W4ESK (W3GRF, opr.) 244,728, W2WZ 209,790, W3DHM 208,620, W8ZY 194,394, W4CEN 188,307, W5ENE 167,790, W3JTC 166,725, W8FGX 158,436, W8BTI 148,365, W8HGW 141,816, W3BVN 141,410, W1LOP 131,400, W1RY 129,150, W3GHS 127,449, W6CYI 122,320, VE3ZW 119,196, W4BRB 118,548, W3MFW 117,504, W3ALB 115,420, W3KT 112,398, W1BFT 109,737, W9IOP 107,107, W6RW 106,110, VE2WW 105,264, W7PGS 102,684, W4DQH 101,592, W7PGX 101,304, W6PB 101,010, W8PQQ 100,947, W8ACE 100,584, W9NDA 100,500.

To see how you compared with others in your vicinity, check your score against these U. S. and Canada licensing area leaders:

W1LOP	131,400	WØDAE	96,390
W2SAI	320,829	VE1PQ	75,936
W3CTJ	272,160	VE2WW	105,264
W4KFC	258,512	VE3ZW	119,196
W5ENE	167,790	VE4RO	54,080
W6CYI	122,320	VE5QZ	4536
W7PGS	102,684	VE6MN	7560
W8ZY	194,394	VE7VO	39,216
W9IOP	107,107	VO6N	3036

The upturn in activity of stations in the multi-operator category rates special mention. Each of the following such stations, though not competing with single operators, made an especially noteworthy showing: W3MSK 243,009, W2AGO 230,442, W3LVF 208,512, W6IBD

This is the fancy operating position at W2SAI from which Jerry Mathis, W3BES, was able to take both Southern New Jersey awards, meanwhile running up the top c.w. and No. 3 'phone score in U.S.-Canada. Jerry's 320,829-point c.w. total is the biggest from W since the 1950 Contest. No deterrent to his performance was the antenna structure pictured on the cover of September *QST*.

190,050, W6AM 161,352, W4HQN 130,011. See the tabulation of scores for calls of contributing operators.

Leaders in number of contacts were W2SAI 467, W3CTJ 432, W4KFC 404, W3MSK 403, W4ESK 396, W2AGO 386, W3DHM 380, W2WZ 370, W3LVF and W6IBD 362, W8ZY 358, W4CEN 343, W5ENE 329, W8FGX 326, W3JTC 325, W6AM 324, W8BTI 315, W8HGW 311, VE3ZW 301, W1LOP 300.

Highest multipliers (sum of countries-worked totals for each band): W2SAI 229, W4KFC 214, W3CTJ 210, W4ESK 206, W3MSK 201, W2AGO 199, W3LVF 192, W2WZ 189, W3DHM and W4CEN 183, W8ZY 181, W6IBD 175, W3JTC 171, W5ENE 170, W6AM 166, W8FGX 162, W3BVN 158, W8BTI 157, W8HGW 152, W4HQN 151, W1RY 150, W4BRB 148, W3GHS 147, W1LOP 146, W3ALB 145, W3MFW 144, W3KT and W9IOP 143.

Maintaining an hourly average of 33.5 QSOs through 67 hours of contest operation, KG4AF piled up 2244 contacts, a multiplier of 81, and a fancy 545,292 points, for the top score from outside W/VE. Gordon wheeled his kw. from band to band in true contestmanship fashion, making use of them all from 1.8 to 28 Mc. Recently departed from KG4, he will be sorely missed by those in quest of Guantanamo QSOs.

Veteran DX competitor KV4AA turned in his customary sterling performance, scoring 341,510 points, 1608 contacts, 71 multiplier, for the second highest spot. An excellent score also comes from Hawaiian winner KH6MG, next in line with 1574 stations worked, a 72 multiplier and 339,552 points.

Other high totals from outside W/VE: VP9BF 296,944, KV4AQ 291,028, VP9BDA (mult. opr.) 269,640, KH6IJ 223,788, CE3AG 215,280, KP4JE 200,202, KH6PM 200,064, KZ5BS 199,013, XE2OK 147,539, KH6ER 141,708, TI2TG 140,296, KP4CC 133,280, LU1EP 117,044, KP4UB 102,344, PY4IE 101,495. Top European scores: EA4CN 91,828, EA1AB 71,326, G5RI 59,297; African: ZE3JP 67,896, FF8AG 67,716, CN8EG 39,050; Asiatic: TA3AA 23,610, JA3AB 4875, JA3AF 4790.

Leaders in number of contacts with W/VE: KG4AF 2244, KV4AA 1608, KH6MG 1574, KV4AQ 1565, VP9BF 1479, VP9BDA 1455, KH6IJ 1097, KP4JE 1094, KH6PM 1042, CE3AG 1040, XE2OK 1011, KH6ER 964, KZ5BS 937, KP4CC 915, TI2TG 900, KP4UB 780, EA4CN 701.

Highest multipliers (sum total of U. S./Canadian licensing areas worked per band): KG4AF 81, KH6MG 72, KV4AA and KZ5BS 71, CE3AG 69, KH6IJ 68, VP9BF 67, KH6PM 64, VP9BDA 63, KV4AQ 62, KP4JE 61, LU1EP 58, YN1AA 55, PY4IE 53, TI2TG and W6DFY/KP4 52, ZL1MQ 51.

The 'Phone Section

For the second consecutive year, the leading W/VE 'phone score comes from Virginia section and W4ESK. With a 198,720 point total by virtue of his 480 contacts and 139 multiplier, Rush bettered his 1952 work by 50,000 points and latched onto 79 different countries in 80 operating hours. It took the collective efforts of a number of brother amateurs to get the W4ESK contest site at Leesburg, Virginia, on a paying basis — what with erecting the 60-foot tower for the 10/20-meter rotary and the vertical for 40 and 75. Rush vows it was well worth the trouble, though, and guarantees to be in there fighting next year.

Antenna specialist W1ATE also crowded the 200,000 mark by rolling up 189,114 points with 490 QSOs and a 129 multiplier. A number of European operators reported Chad's signal the outstanding W representative on all bands, and one of the few able to override the terrific 7-Mc. b.c. QRM. The antenna set-up at W1ATE is ever in a state of flux, but during the contest Chad relied on two 3-element wide-spaced rotaries plus a 6-element Sterba curtain for 20, a 4-element rotary for 10–11 meters, a folded dipole for 40, and a 3-element vertical beam and 3-wire folded dipole for 75 meters.

In the show position, W2SAI, with W3BES at the mike, scored 171,235 points, 498 stations worked, multiplier 115. Jerry showed he is as savvy on 'phone as on c.w., with 78 countries contacted in 80 hours on the air.

Other high 'phone scores from W/VE: W3DHM 136,899, W3MSK 124,254, W2SKE 113,918, W3LVF (mult. opr.) 108,570, W4KWY 93,318, W4DQH 90,882, W4NTZ/4 83,904, W9EWC 79,905, W5BGP 79,596, W3GHS 72,518, W2WZ 67,284, W8NGO (mult. opr.) 62,775, W6VVZ 58,824, W4OM 57,510, W5JUF 57,368, W8NXF 56,742, W1MCW 55,420, W9NDA 53,133, WØPRZ 51,750, W3KT 50,922, VE3KF 50,358. Leaders in number of contacts: W2SAI 498, W1ATE 490, W4ESK 480, W2SKE 372, W3DHM 371, W3MSK 356, W3LVF 329, W4DQH 308,

This quartet of ardent 'phone DXers got together on the W1ATE antenna farm after the contest to discuss who worked whom. *L. to r.*: W4ESK, W1ATE, W4OM and W4KWY. Combining their individual scores, one gets 538,662 points. Little wonder they're smiling! Incidentally, W4ESK and W1ATE chalked up the first and second highest W/VE 'phone scores.

Luis Desmaras, CE3AG, was the highest South American c.w. scorer with a rousing 215,280 points and 1040 contacts. If you missed Luis in the contest, chances are you hooked him from Easter Island when he fired up CE0AA at that elusive spot as of August 7th.

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W4NTZ/4 304, W4KWY 302. Highest multipliers: W4ESK 139, W1ATE 129, W3DHM 123, W3MSK 117, W2SAI 115, W3LVF 110, W9EWC 105, W2SKE and W4KWY 103, W3GHS and W5JUF 101.

Leading mikemen by licensing areas:

W1ATE	189,114	W0PRZ	51,750
W2SAI	171,235	VE1PQ	10,146
W3DHM	136,899	VE2AHE	11,400
W4ESK	198,720	VE3KF	50,358
W5BGP	79,596	VE4RO	40,375
W6VVZ	58,824	VE5GF	378
W7HIA	33,600	VE7VO	26,730
W8NGO	62,775	VO6N	6030
W9EWC	79,905		

Biggest station score in the overseas 'phone category was chalked up by 11 Radio Society of Bermuda members at the controls of VP9BDA. Providing the W/VE gang with 1009 QSOs on all bands from 160 to 10 meters, the VP9s kept the 120-watt rig in action throughout the 96-hour contest period and amassed 178,974 points with a 61 multiplier. Antennas were long wires and dipoles.

Highest reported single-operator score from outside W/VE was that of KV4BB, with 176,080 points, 828 contacts, 71 multiplier. Bill ran one kw. to p.p. 250TLs modulated by 810s, and employed a 20-meter 3-element beam, a ground plane on 10–11, and a 1200-foot long wire on 40–75–160.

Barbados entrant VP6SD was next with a fine 155,935 points from his 805 stations worked and a multiplier of 65. Sydney promises to take part in the 1954 contest from VE2-land, where he's now located.

Other high-scorers from outside W/VE were KH6MG 72,270, CT1BS 68,921, CT1CL 59,422, KL7AON 42,159, KH6PM 34,830, XE2W 28,428, ZS6DW 27,480, KH6IJ 25,047, G2PU 24,708, PJ2AA 22,194, EA4DB 22,113, LU1DDV 21,252, CT1QF 21,204. Largest totals by continental areas: *Africa* — ZS6DW 27,480; *Asia* — TA3AA 7560; *Europe* — CT1BS 68,921; *North America* — VP9BDA 178,974; *Oceania* — KH6MG 72,270; *South America* — PJ2AA 22,194.

The crew at VP9BDA led in number of W/VE 'phone contacts with 1009. Other leaders were KV4BB 828, VP6SD 805, CT1BS 569, CT1CL 543, KH6MG 438, KL7AON 365, G2PU 284, EA4DB 278, PJ2AA 274, KH6PM 270.

Scouting for W/VE contacts from 1.8 through to 28 Mc. paid off handsomely for KV4BB, whose multiplier of 71 was the highest since 1949. Availability of 7-Mc. 'phone to W/VEs the second week end also boosted the multipliers of these participants: VP6SD 65, VP9BDA 61, KH6MG 55, XE2W 46, KH6PM 43, CT1BS 41, ZS6DW 40, KL7AON 39, CT1CL 37, CT1QF 36, KH6IJ 33.

Club Scores

In each ARRL DX Contest, a gavel with an engraved silver band goes to the radio club whose members submit the highest aggregate score. As it has so often in the past, the competition for this useful and attractive award again produced a lively battle betwixt the Frankford Radio Club and the Potomac Valley Radio Club. And again this year Frankford, paced by the potent 'phone and c.w. scores of member W3BES operating W2SAI, came out on top and earned its third straight DX Test gavel. The Northern and Southern California DX Clubs also turned in excellent aggregates for third and fourth place, respectively, in the club standings.

A tabulation of all clubs that entered the competition accompanies this report. Special certificates are being awarded to the leading 'phone

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The "young squirts" must look to their laurels when Karl Duerk, W8ZY, brasspounder since 1912, gets going. Karl turned in the top W8 c.w. score, 194,394, and walked off with the Ohio section award.

Ivan Pastre, FF8AG, racked up the No. 2 African c.w. score from this neat layout in French Sudan. Formerly FQ3AT and FE8AB, Ivan, with his husky signal and conscientious QSL policy, has supplied new ones for countless DXers.

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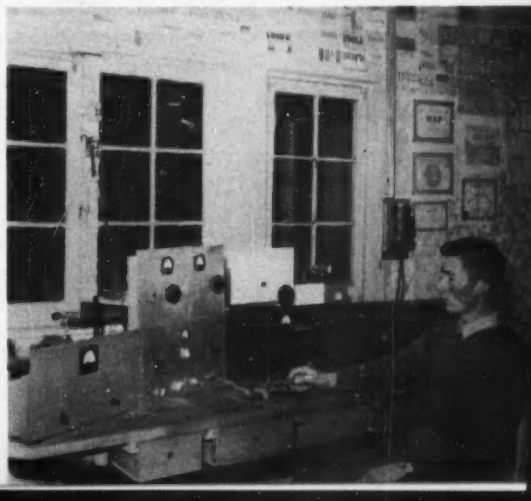
and c.w. operators in each club that submitted the minimum number of entries required by the rules. Congratulations to the winners!

Sidelights

Special mention for perennial consistency accrues to W5ENE, Northern Texas c.w. winner for the *sixth* straight year, and to British G2PU, whose outstanding signal has earned him his *seventh* consecutive 'phone award. . . . Only reported Asia-to-North America QSOs on 75-meter 'phone during the contest were from TA3AA to W1ATE and W4ESK. . . . W6AM exchanged c.w. serial numbers with KH6IJ on *seven* bands. . . . A number of changes in the contest rules were proposed. Rest assured, gang, that every suggestion which might result in a better and more enjoyable contest for *all* participants will be carefully considered by ARRL's Contest Planning Committee prior to announcement of the rules of the 1954 contest. . . . Now for some words of wisdom culled from contestants near and far. . . . "Although conditions were not of the best, these unpredictable happenings add a bit of spice to the event. I was reminded of the good old days of the 210 TNT. Many thanks for a couple of very enjoyable c.w. week ends." — *VE3DT*. . . . "With a selective receiver the contest was a real pleasure. Not one repeat was necessary. The discipline of W/VE stations was wonderful." — *HB9AT*. . . . "Even with terrible conditions I had a good time and made a far better score than last year. I found the 'hamsmanship' excellent and am looking forward to another contest here before I return to W2-land." — *KT1UX* (*W2UUX*). . . . "Bandas de 10–11 metros: muerta; 20 metros: muy buena; 40 metros: escepcionalmente buena; 80 metros: buena." — *XE2W*. . . . "Very pleased to work several new states for WAS but sorry the W7s did not come through." — *SM6ACO*. . . . "All in all, had a good time. Would like to praise the operating of such men as CE3AG, FF8AG, KV4AA and others, who managed to keep the QRM down." — *W9DWD*. . . . "Quite sure that conditions during the 20th ARRL DX Competition will be better, because it will be a jubilee contest." — *DL1DX*. . . . "Congratulations on stirring up some honest-to-goodness activity in such trying times." — *W6PYH*. . . . "Outstanding signals here were those of W1ATE, W2SAI, W4KE, W5ENE, W6s AM VVZ, W8BHW. Our Maui Amateur Radio Club missed some top operators like KH6s AEX DK and EL, who could only be on for a short while. Watch out for us next year!" — *KH6PM*. . . . "Got my T2FD antenna up for second c.w. week end and it worked fine, all bands from 80 to 15, but wish ARRL would pick a contest time when we have better conditions on 27–28 Mc." — *W6BYH*. . . . "Although the bands opened up less than an hour each on the two days of operation, it was a pleasure to work those Americans we did and to give them another multiplier." — *OD5XX*. . . . "ARRL must have done a good job in advising foreign stations about the contest. Never heard so many Europeans on the air." — *W8NXF*. . . . "Practically all the W/VE boys were S9 and the QRM was so bad that I kept the crystal filter on the sharpest position throughout the contest. Hope I didn't insult some of the kw. brethren with the reports I handed out. Returning to the States in December and still need North Dakota and Montana for WAS. How about it, fellows?" — *CN8EG*. . . . "Conditions were only fair but enjoyed the Test and



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New Zealander J. Bruce, ZL3OA, amassed 92,267 points and took his country's c.w. Certificate of Performance with this 100 per cent home-brew station.

hope to be in many more." — *W6PTQ*. . . . "Would like to express my appreciation to the W6 gang for their courteous operating. The path from here to W6 was op n only for a short time but due to good operating at their end I was able to work quite a number. Here's to another contest!" — *GM8MJ*.

Disqualifications

The entrants below are deemed ineligible for score listings or awards in the 1953 DX Competition. In each case disqualification is for off-frequency operation as confirmed by a single FCC citation or advisory notice or two accredited Official Observer measurements: *C.w.:* W2s GLO IIG SAW, W3LEZ. *'Phone:* W5s CEW INL, W6s AM YY, W8RLT.

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Let's hope that the Europeans are S9 on all bands during the Twentieth ARRL International DX Competition, and that 10–11 meters open wide to give the low-power men a break. Dates for the 1954 affair: 'Phone — Feb. 12th–14th and March 12th–14th; c.w. — Feb. 26th–28th and March 26th–28th. There'll be QSOs galore for everyone, conditions notwithstanding, so get set *now* to participate.

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Our thanks go to the following operators who, although not wishing to compete, forwarded their logs for checking purposes: *C.w.:* W5RX, W6RO, VE1s AE YB, VE7FC, GI4RY, OZ2E, PAØUL, SM5HH, VK2PV. *'Phone:* VE2CK.

C. W. SCORES

Nineteenth International DX Competition

Operator of the station first-listed in each section and country is winner for that area. . . . The multiplier used by each station in determining score is given with the score — in the case of U. S.-Canada this is the total of the countries worked on each frequency band used; in the case of non-W/VE/VO entries it is the total of the U. S.-Canada districts worked on each band. . . . The total number of contacts is listed next. . . . The letters A, B, and C approximate the input to the final stage at each station; A indicates power up to and including 100 watts; B indicates over 100 watts, up to and including 500 watts; C indicates over 500 watts. . . . The total operating time to the nearest hour is given for each station and is the last figure following the score. . . . An asterisk following a call indicates contacts were made exclusively on the 27- and/or 28-Mc. bands. . . . Example of listings: W3CTJ 272, 160-210-432-C-82, or final score 272, 160; multiplier 210; 432 contacts; power over 500 watts; total operating time 82 hours. . . . Stations manned by more than one operator are grouped in order of score following single-operator listings in each section or country tabulation; calls of participants at multi-operator stations are listed in parentheses. . . . Where three or more multiple-operator entries appear, the top-scoring station is being awarded a certificate.

ATLANTIC DIVISION

E. Pennsylvania

W3CTJ.....272,160-210-432-C-82
W3DHM.....236,628-183-380-C-64
W3GHS.....127,449-147-289-B-57
W3MFW.....117,504-144-272-C-72
W3ALB.....115,428-145-266-C-50
W3KT.....112,398-143-262-C- -
W3EQA.....87,552-128-228-C-65
W3ALX.....34,715- 89-145-B- -
W3DLR.....34,419- 77-149-C-47
W3IMV.....26,271- 63-139-B-30
W3GHD.....23,331- 77-101-B- -
W3RFI.....21,840- 65-112-B-30
W3NA.....20,520- 57-120-C-25
W3MLW.....19,776- 58-115-B-50
W3HER.....19,305- 61-105-B-25
W3MDE.....17,100- 57-100-B-40
W3CHH.....15,660- 58- 90-C- -
W3EVW.....14,076- 51- 92-C-13
W3GRS.....5586- 38- 49-A-11
W3QLW.....5580- 34- 54-B-22
W3EAN.....4896- 34- 48-C- 9
W3IXN.....4278- 31- 46-B- -
W4DGJ/3.....1035- 15- 23-A-15
W3ADE.....540- 12- 15-B- 6
W3LAP.....297- 9- 11-B- 4
W3VDY.....210- 7- 10-A- -
W3LVF (W3s EKK ISE KDF)
284,512-192-362-C-80
W3CGS (W3GHD)
74,820-116-215-C-50
W3MWL (W3s ARK BIP)
65,124-108-201-B-34
W3JBC (W3JNQ) 23,205- 69-115-C-64

Md.-Del.-D. C.

W3JTC.....166,725-171-325-C-80
W3BVN.....141,410-158-296-B-60
W3HTE.....87,011-127-231-C-42
W3JTK.....78,840-128-219-C-70
W3AOO.....63,322-118-193-B-34
W3HEC.....61,697-103-201-C-50
W3EIS.....55,200-100-184-B-60
W3GRP.....39,525- 85-155-C- -
W3DRD.....36,105- 83-145-B-30
W3MFJ.....25,908- 68-127-B- -
W3FQB.....25,425- 75-113-A-43
W3EPR.....11,328- 48- 79-B-25
W3AEL.....9315- 45- 69-B-15
W3CDZ.....9306- 47- 66-A- -
W3LVJ.....7308- 42- 58-A-12
W3DVO.....3525- 25- 47-C-22
K3WAS.....3080- 28- 37-C-12
W3RNT.....2079- 21- 33-B-24
W3MSK (W3s MCG NOE)
243,009-291-493-C-80
W3ZQ (W4NF) 51,154- 98-174-C-85
W3WV (W3PZW) 21,576- 62-116-C- -

So. New Jersey

W2SAI.....379,829-229-467-C-80
W2GGL.....73,809-128-205-C-45
K2CH.....32,951- 83-126-B-54
W2QKJ.....9460- 46- 79-B-40
W2VUM.....1440- 20- 24-B-11
W2SDB.....1054- 17- 22-B-13

W. New York

W2FBA.....83,916-126-222-C-40
W2AW.....32,160- 80-134-B-32
W2SVF.....16,492- 62- 89-C- -
W2BJH.....15,423- 53- 99-B-47
W2TXB.....14,256- 48- 99-C- -
W2MA.....12,450- 50- 83-C- -
W2PZM.....5376- 32- 56-B-10
W2ICE.....5076- 36- 47-B- -
W2QJM.....4092- 31- 44-B-16
W2DOD.....2448- 24- 34-B-12
W2VXA.....1953- 21- 31-B- -
W2CNT.....1224- 17- 24-B- 5
W2QQ.....798- 14- 19-B- 6
W2UTH.....714- 14- 17-B- 8
W2KEL.....60- 4- 5-B- 3

W. Pennsylvania

W3LXE.....50,778- 93-182-C-31
W3LMM.....24,276- 68-119-C-46
W3APQ.....11,163- 61- 61-A-39
W3DKL.....300- 10- 10-B- 6
W3NCJ.....189- 7- 9-B- -
W3KNQ.....12- 2- 2-A- -

CENTRAL DIVISION

Illinois

W9NDA.....100,560-134-250-C- -
W9HUZ.....63,814-122-229-B-70
W9GRV.....76,167-117-217-C-73
W9NH.....72,846-114-213-B-67
W9FKC.....37,209- 79-157-C-34
W9ABA.....30,096- 76-132-C-40
W9VIN.....27,648- 72-128-B-60
W9FID.....24,361- 63-129-C-45
W9PNE.....11,172- 49- 76-B-27
W9WKU.....7280- 40- 61-C-28
W9WKO.....2960- 27- 49-B-17
W9WJV.....2400- 25- 32-B-19
W9KMN.....1716- 22- 26-B-16
W9ALI.....1458- 18- 27-B-18
W9TGT.....720- 15- 16-A- 5
W9OKI.....297- 9- 11-B-10
W9GNG.....75- 5- 5-A- 5
W9GSB.....27- 3- 3-A- 1
W9ISM.....12- 2- 2-B- 3
W9GVZ (W9s NZM PKW)
97,042-121-266-C-60
W9DWD (W9s DDP OUH UVM)
17,525- 59-100-C-44

Indiana

W9IOP.....107,107-143-255-C-70
W9JIP.....37,440- 78-160-C-62
W9UC.....882- 14- 21-B-11

Wisconsin

W9RQM.....63,327-101-209-C-42
W9LNM.....16,005- 58- 92-C- -
W9GIL.....15,600- 52-100-B-30
W9MQK.....10,800- 40- 90-B-24
W9RBI.....9720- 45- 72-C-11
W9GWK.....6747- 39- 57-B-16
W9HHN.....5772- 37- 52-B-20
W9FDX.....5355- 35- 51-B-15
W9RKP.....5346- 33- 54-B-45
W9SDK.....2997- 27- 37-A-17
W9KXK.....1404- 18- 26-A-11
W9OMZ.....147- 6- 7-B- 1

DAKOTA DIVISION

North Dakota

WØBPO.....150- 5- 10-B- 9

South Dakota

WØBLZ.....30,456- 72-141-B-36
WØLBS.....351- 9- 13-B-14

Minnesota

WØJSN.....13,197- 53- 83-B-40
WØTCR.....13,113- 47- 93-C- -
WØVIP.....4131- 27- 51-B-10

DELTA DIVISION

Arkansas

W5MPG.....55,206-109-188-C-43

Louisiana

W5CEW.....18,360- 60-102-B- -

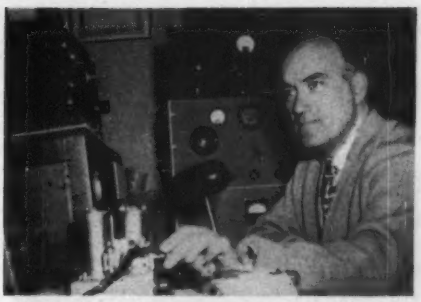
Mississippi

W5CKY.....72,036-116-207-C-47
W5AVF.....29,424- 69- 99-B-29

♦

Shown, *l. to r.:* VP9s AX L BG BI G and D. These 'phone men, among others, kept at it for the entire 96-hour period and multi-operated the Radio Society of Bermuda's VP9BDA to 178,974 points. VP9s BC BD BG BI BJ L and X also used the set-up effectively on c.w., piling up an additional 269,640 points. (*Photo courtesy Bermuda Royal Gazette*)

Herman Greve, W9EWC, doesn't look unhappy about being Wisconsin's winner and high W9 'phone.



A 91,828-point tally enabled Luis Auyanet, EA4CN, to lead the European c.w. contingent by a wide margin.

Tennessee

W4DQH.....101,592-136-305-C-58
W4FKA.....12,888- 50- 86-B-34
W4UDS.....528- 11- 16-A- 7
W4OGG.....480- 10- 16-A- 4

GREAT LAKES DIVISION

Kentucky

W4OMW.....340- 10- 12-B- 5

Michigan

W8UAS.....47,790- 99-177-C-60
W8UPN.....39,441- 73-139-C-29
W8AAI.....11,421- 47- 81-B-16
W8KPL.....5565- 34- 51-A- -
W8DLZ.....2850- 25- 38-B-16
W8HA.....1482- 19- 26-A-19
W8MCC.....330- 10- 11-A-10
W8DUS (W8RAE) 30,150- 75-134-C-36

Ohio

W8ZY.....194,304-181-353-C-54
W8FGX.....158,436-162-328-C-70
W8BTI.....148,385-157-315-C-66
W8HGW.....141,816-152-311-C-30
W8ACE.....100,584-132-254-C-38
W8ZJM.....62,316-108-193-B-50
W8BOJ.....13,932- 54- 86-C-12
W8DQC.....9471- 41- 77-C-18
W8EV.....9108- 46- 66-A- -
W8AJW.....7080- 40- 59-A- -
W8JIN.....6660- 40- 55-C- 9
W8DAE.....4896- 32- 51-B-23
W8PM.....4257- 33- 43-B-18
W8HFE.....3840- 32- 40-C- 5
W8LOF.....3780- 28- 45-A- 9
W8JGU.....2880- 26- 37-B- -
W8FJR.....1920- 20- 32-C- 4
W8WWU.....972- 18- 18-B- 6
W8JFC.....384- 8- 16-B- 5
W8KMF.....341- 11- 11-A- 6

HUDSON DIVISION

Eastern New York

W2HO.....41,583- 83-147-B-55
W2EWD.....27,600- 71-130-B-56
W2AWF.....18,966- 58-109-B-38
W2CJM.....9240- 48- 77-B-30
W2HSZ.....7254- 39- 62-B-22
W2MHE.....4896- 34- 48-B-16
W2VCB.....4185- 31- 45-B-32

N.Y.C.-L.I.

W2WZ.....200,790-109-370-C-72
W2GSN.....29,835- 65-153-C- -
W2WC.....29,151- 79-123-B-36
W2SRV.....28,136- 67-136-B-36
W2CTO.....23,520- 70-112-B-30
W2ARE.....20,010- 58-115-B-36
W2AZS.....18,630- 54- 95-C-24
W2BWC.....12,549- 47- 89-B-25
W2KTF.....7052- 43- 56-B-14
W2BO.....6549- 37- 59-C-21
W2JB.....2142- 21- 34-B-11
W2AWH.....2067- 24- 29-B-16
W2KGN.....2040- 20- 34-B-17
W2EVT.....288- 8- 12-B- 9
W2NHH.....3- 1- 1-A- -

Northern New Jersey

W2AGW.....63,024-104-202-C-37
W2ATE.....60,894-102-199-B-41
W2GNQ.....43,890- 85-160-C-30
W2EQS.....43,480- 85-154-B-88
W2CWK.....31,932- 82-142-A-38
W2CDP.....15,960- 56- 95-B-22
W2DJT.....12,882- 57- 76-B-23
W2LYO.....3321- 27- 41-B-30
W2AQT.....2184- 28- 28-A-16
W2NIY.....1782- 22- 27-A- -
W2LSJ.....1653- 19- 29-A- 3
K2CW.....1122- 17- 22-B-20
K2BCK.....540- 12- 15-B- 6
W2CVW.....432- 12- 12-B- 7
W2GJD.....48- 4- 4-B-10
W2HEG.....12- 2- 2-A-10
W2AGO (W2s HZY OST) 239,642-199-385-C-90

MIDWEST DIVISION

Iowa

W9NWX.....56,200-100-188-B- -
W9FDL.....24,408- 72-113-C-27
W9DIB.....3- 1- 1-A- -

Kansas

W9DAE.....96,390-126-255-C-50
W9ERI.....15,264- 53- 96-C-28
W9VBQ.....7800- 40- 65-B-19
W9YZR.....7371- 39- 63-C-30
W9BCI.....6120- 34- 60-A-30
W9IUB.....4836- 31- 52-B-14
W9DEP.....3645- 27- 45-B-18
W9HAW.....100- 5- 5-A-10

Missouri

W9DU.....29,304- 74-132-B-45
W9BMM/9.....24,552- 66-124-C-60
W0CVZ.....16,920- 60- 94-B-36
W0ZRP.....16,585- 58- 96-C-36
W0ETW.....1500- 20- 25-A-48
W0FNO (W0AIW) 94,875-125-253-C- -

Nebraska

W0GBS.....6405- 35- 61-C-25
W0NXF.....3875- 31- 43-B-17

NEW ENGLAND DIVISION

Connecticut

W1LOP.....131,400-146-300-C-65
W1RY.....129,150-150-287-B-44
W1AB.....76,128-122-208-C-53
W1ODW.....47,328- 91-174-B-56
W1BIH.....47,120- 95-166-C- -
W1DIT.....39,261- 77-133-C-25
W1FTX.....21,384- 72- 99-B-26
W1ORP.....21,060- 65-104-C-17
W1DHO.....16,380- 53-105-A-38
W1AJO.....13,230- 49- 90-B-37
W1TX.....9315- 45- 71-C- 7
W1VG[3].....9100- 51- 60-B- -
W3VES/1[3].....5565- 35- 53-B-10
W1WPO[3].....4725- 35- 45-B-40
W1NJM[3].....3948- 28- 47-B- 8
W1TYQ.....2800- 24- 40-A-13
W1APA.....1840- 20- 32-B-15
W1UH[3].....780- 14- 19-A- 8
W1AW (W1s QIS WPR)[3] 782- 13- 18-C- -

Maine

W1QCJ.....2250- 25- 30-B-11
W1VEH.....147- 7- 7-B-11

CLUB SCORES

Club	Score	C.W. Winner	'Phone Winner
Frankford Radio Club	2,286,653	W2SAI	W2SAI
Potomac Valley Radio Club	1,884,093	W4KFC	W4ESK
Northern California DX Club	973,112	W6PB	W6PYH
Southern California DX Club	908,684	W6CYI	——
Maui Amateur Radio Club	796,665	KH6MG	KH6MG
Ohio Valley Amateur Radio Assn.	472,465	W8FGX	W8ACE
The DX Club	426,215	W3GH8	W3GH8
Northwest Amateur Radio Club	222,304	——	——
Rochester DX Assn.	162,446	W2FBA	W2FBA
North Suburban Radio Club	153,152	W9GRV	——
Ridgewood Amateur Radio Club	146,425	W2ATE	——
Tri-City Amateur Radio Club	127,746	——	——
Quinebaug Valley Radio Club	104,056	——	——
West Seattle Amateur Radio Club	100,692	——	——
Amateur Radio League of Manitoba	94,455	——	——
Niles Amateur Radio Club	88,778	——	——
Connecticut Wireless Assn.	81,767	W1BIH	——
Wisconsin Valley Radio Assn.	63,327	——	——
Dayton Amateur Radio Assn.	62,316	——	——
Four Lakes Amateur Radio Club	54,498	W9LNM	W9RBI
Narragansett Assn., of Amateur Radio Operators	49,005	——	——
Dade Radio Club	48,381	W4LQN	——
Raritan Valley Radio Club	34,932	——	——
Milwaukee Radio Amateurs Club	31,356	W9GIL	W9FDX
Providence Radio Assn.	30,573	——	——
Westpark Radiops	28,190	W8AJW	W8AJW
Denver Radio Club	25,461	——	——
Mid-Cities Amateur Radio Club	19,335	——	——
Albany Amateur Radio Assn.	18,966	——	——
El Ray Radio Club	14,535	——	——
South Shore Amateur Radio Club	14,400	——	——
Garden City Radio Club	14,250	——	——
Sonoma County Radio Amateurs	9804	——	——
South Lyme Beer, Chowder & Propagation Society	9180	——	——
Yarmouth Amateur Radio Club	8988	——	——
Tri-County Amateur Radio Club	7686	——	——
Palo Alto Amateur Radio Assn.	7560	——	——
Milwaukee School of Engineering A. R. Club	5390	——	——
Montreal Amateur Radio Club	5280	——	——
St. Louis University Amateur Radio Club	1602	——	——

Morris Guzick, shown tuning up W5BGP, made the top W5 'phone total and took the Northern Texas section award hands down.

E. Massachusetts

W1BOD.....89,968-116-234-B-56
W1AZY.....57,992- 92-192-B-38
W1PEG.....14,535- 51- 95-B-48
W1DSF.....14,400- 48-100-B-34
W1UBC.....9675- 45- 73-B-31
W1PKW.....9546- 43- 74-B-16
W1DDO.....2028- 26- 26-A- 9
W1ABA.....585- 13- 15-B- 8
W1JCK.....68- 4- 4-B- 4
W1PLJ.....27- 3- 3-A- 8
W1WAG.....27- 3- 3-A- 4
W1MX (W4YHD, W8GQL)
117,177-139-221-C-90

W. Massachusetts

W1ZD.....66,804-114-196-C-43
W1AEW.....23,312- 62-126-B-53
W1JYH.....4884- 37- 44-A-10
W1RB.....4662- 37- 42-A-26

New Hampshire

W1BFT.....109,737-137-267-B- -
W1CRW.....19,380- 66- 95-C-12
W1NHJ.....7696- 42- 61-B-20
W1FZ.....840- 14- 20-A- 3

Rhode Island

W1CJH.....49,005- 99-165-B-40
W1MLJ.....30,573- 79-129-B-55
W1AWE.....14,256- 48- 99-C- -
W1AOP.....1890- 21- 30-B- -

NORTHWESTERN DIVISION

Idaho

W7MOU.....3525- 25- 47-B-20

Montana

W7KVU.....73,629-101-243-C-47

Oregon

W7AHX.....34,875- 75-155-B-52
W7DAA.....29,560- 68-148-C-40
W7OCL.....7828- 38- 69-C-36
W7LNG.....4929- 31- 53-B-30
W7JLU.....2691- 23- 39-A-20

Washington

W7DL.....75,492-108-233-C- -
W7PQE.....57,630- 95-185-C-51
W7CNM.....39,366- 81-162-B-50
W7AJS.....22,509- 61-123-C-40
W7EJD.....21,924- 63-116-C-59
W7NLI.....19,662- 58-113-C- -
W7HAD.....4524- 29- 52-B-15
W7HJC.....3184- 28- 45-C-15
W7MVC.....684- 12- 19-A- 7
W7HDM.....84- 4- 7-A- 4

PACIFIC DIVISION

Nevada

W7KEV.....13,311- 51- 87-C-19
W7KJQ.....2808- 24- 39-B-10

Santa Clara Valley

W6VE.....57,024- 99-192-C- -
W6SR.....31,974- 73-146-B-61
W6ZZ.....7548- 37- 68-B-33
W6VDG (W6EAE) 77,970-115-227-C-74

East Bay

W6PB.....101,016-130-259-C-60
W6TT.....93,330-122-255-C-70
W6PYH.....87,483-121-241-C-60
W6DTP.....66,600-111-208-C-60
W6LDD.....58,425- 95-205-C-85
W6GIZ.....32,163- 71-151-C-46
W6MVQ.....30,810- 79-130-C-29
W6QDE.....26,112- 68-128-C-36
W6LMZ.....18,231- 59-103-B-24
W6AJN.....10,788- 31-116-B-40
W6DUB.....10,584- 42- 84-C-16
W6EJA.....9576- 38- 64-B-22
W6FLT.....8280- 40- 69-B-30
W6TI.....8103- 37- 73-C-28
W6IPH.....7245- 35- 69-B-24
W6RCC.....3075- 25- 41-B-24
W6OVO.....180- 6- 10-C- 1
W6RRH.....91- 7- 13-B-10
W6BZU.....45- 3- 5-B- 1
W6LW (W6MHB) 91,113-121-151-C-90
W6KEK (W6CTL) 10,280- 45- 76-B- -

San Francisco

W6WB.....78,309-113-231-C- -
W6ATO.....47,502- 87-182-C-78
W6CPB.....29,376- 72-134-B-60
W6GQK.....22,692- 62-122-C-61
W6HQN.....9804- 43- 76-B-21
W6ERS.....945- 15- 22-A-65

Sacramento Valley

W6ONZ.....5184- 27- 64-C-34
W6EFM.....5112- 36- 48-C-12
W6BIL.....1188- 18- 22-B- 7
W6HWF*.....12- 2- 2-B- 3

San Joaquin Valley

W6GWQ.....33,525- 75-149-C-48
W6BYH.....17,574- 58-101-C-23
W6MEL.....12,549- 47- 89-C- -

ROANOKE DIVISION

North Carolina

W4CEN.....188,307-183-343-C-55
W4AIX.....34,365- 79-145-B-42
W4KE.....21,735- 63-115-C-26
W4GXB.....17,490- 53-110-C-29
W4OG.....5726- 27- 46-C-16
W4LQC.....383- 12- 16-A-12

South Carolina

W1HB/4.....6300- 36-59-B-12
W4FNS.....741- 13-19-B- -
W4DNR.....478- 12-13-A-11
W3HH/4.....27- 3- 3-B- 1

Virginia

W4KFC.....253,512-214-404-C-83
W4ESK*.....241,728-206-396-C- -
W4QM.....61,640-110-209-C- -
W4SHJ.....14,694- 54- 87-B-25
W4JAT.....12,690- 45- 94-B- -
W4NH.....4032- 28- 48-B-10
W4YE.....2404- 23- 36-C-10
W4GQL.....1920- 20- 32-B- -
W4CC.....630- 14- 15-A- 2
W4UWS.....429- 11- 13-A- 6
W4RNP.....420- 10- 14-B-16
W6LON/4.....363- 11- 11-B- 4
W4HQN (W4s FF NTZ)
130,011-151-287-C-90

West Virginia

W8PQQ.....100,347-133-253-C-53
W8HZA.....4488- 33- 66-B-13

ROCKY MOUNTAIN DIVISION

Colorado

W0AZT.....25,461- 69-123-C- -
W0CDP.....4611- 29- 53-A-22

Utah

W7NOE.....13,292- 46- 97-C-63
W7EHF.....3150- 25- 42-B-15
W7QDJ.....1786- 19- 32-A-20
W7KCP.....682- 11- 22-A-31

Wyoming

W7PGS.....102,684-129-266-C-54

SOUTHEASTERN DIVISION

Alabama

W4ECI.....74,160-120-206-C-60

Eastern Florida

W4BRB.....118,548-148-271-C-60
W4LQN.....25,326- 63-134-B-42
W4TKA.....11,700- 50- 78-A- -
W4EEO.....6552- 42- 52-B-20
W4WHK.....3836- 28- 49-A-37
W4DRK.....2916- 27- 36-B- -
W4TOA.....2730- 26- 35-A-50

Western Florida

W4NN.....42,585- 84-169-B-48

Georgia

W4DCZ.....76,015-115-221-C-74
W4CYA.....7320- 40- 61-B-24

SOUTHWESTERN DIVISION

Los Angeles

W6CTI.....122,520-138-294-C-42
W6RW.....106,110-135-262-C-42
W6HOH.....57,900-100-193-B-70
W6SRF.....55,872- 96-194-C-50
W6LDJ*.....52,000- 93-188-C- -
W6BJU.....47,214- 86-183-C-58
W6BPD.....46,464- 88-176-B-60
W6BUD.....43,587- 87-167-C-66
W6NZW.....33,930- 78-145-C- -
W6ALQ.....27,522- 66-139-C- -
W6APH.....16,800- 56-100-C-30
W6MUR.....15,900- 53-100-C-10
W6UQQ.....15,756- 52-101-C-35
W6HJ.....10,836- 43- 84-B-35
W6NTW.....10,428- 44- 79-A-18
W6JID.....5344- 32- 56-C-29
W6WPI.....3675- 25- 49-A-20
W6KFV.....3096- 24- 43-C-21
W6KWF.....2280- 19- 40-A-19
W6NJU.....1440- 16- 30-A-30
W6PTO.....1050- 14- 25-A-24
W6HPB.....990- 15- 22-B-10
W6UYH.....351- 9- 13-B- -
W6FET.....252- 7- 12-B- 7
W6KNE.....210- 5- 14-B-12
W6GK.....90- 5- 6-B- 6
W6MPQ.....30- 2- 5-A- 3
W6IBD (W6FSJ) 190,050-175-362-C-45
W6AM (W6s ADP BXL GFE QMC)
161,352-166-324-C-90
W6ILP (W6GUF) 17,100- 55-104-C-7

Arizona

W7PGX.....101,304-134-252-B-42
W7ENA.....14,151- 53- 89-A-54
W7QJV.....231- 7- 11-A- 4

San Diego

W6LRU.....33,516- 76-147-A-46
W6NKP.....9675- 43- 75-C-37
W6CHV.....9102- 41- 74-B-26
W6CRT.....5203- 31- 58-A-15

WEST GULF DIVISION

Northern Texas

W5ENE.....167,790-170-329-C-53
W5BNO.....49,317- 89-151-C-54
W5OLG.....12,348- 49- 84-B-34
W5AJA.....8118- 41- 66-C-34
W5VNN.....1365- 19- 24-A-10
W5TVT.....144- 6- 8-A-25

Oklahoma

W5DQV.....49,572- 84-161-B-58
W5VVN.....5083- 32- 53-A-28
W5LJI.....936- 13- 24-B-10

Southern Texas

W5ZD/5.....34,283- 81-141-B- -
W5KCR.....16,652- 56- 99-P-39
W5VIR.....7224- 42- 58-B-12
W5HDS.....2622- 23- 38-A-14
W5DML.....714- 14- 17-C- 3

New Mexico

W5LGS.....12,972- 47- 92-B-29
W5TOU.....741- 13- 19-A- 5

CANADA

Maritime

VE1PQ.....75,936-112-224-B-65
VE1ZZ.....29,640- 76-130-B-49
VE1EK.....10,280- 40- 87-A-23
VE1CU.....6959- 42- 72-A-30
VE1HG.....4902- 32- 43-B-11
VO6N.....3036- 22- 46-A-50
VO6U.....225- 9- 9-A-14

Quebec

VE2WW.....105,264-136-258-B-57
VE2WA.....41,832- 83-168-B-30
VE2BK.....7257- 41- 59-B-11
VE2KZ.....5280- 32- 55-B-11
VE2CK.....5133- 29- 59-B- 7
VE2OL.....3198- 26- 41-A-11
VE2AIE.....1330- 19- 24-A- -

Ontario

VE3ZW.....110,196-132-301-C-71
VE3DT.....8772- 43- 68-B-52
VE3IJ.....5312- 32- 56-B-25
VE3DCQ.....2544- 24- 36-B- -
VE3YV.....1860- 20- 31-B-14
VE3BMB.....1620- 18- 30-A-30
VE3AUU.....450- 10- 15-A- 5

Manitoba

VE4RO.....54,080-104-212-C-57

Saskatchewan

VE5QZ.....4536- 27- 56-A-15
VE5JV.....3174- 23- 46-B- -
VE5RU.....486- 9- 18-A-10
VE5GF.....3- 1- 1-B- -

Alberta

VE6MN.....7560- 35- 72-C-30

British Columbia

VE7VO.....39,216- 76-172-C-52
VE7ZM.....15,180- 50-102-B-24
VE7KC.....8436- 37- 76-B-22

AFRICA

Algeria

FA9RZ.....33,336- 36-309-A-28

Belgian Congo

OQ5GU.....22,770- 23-330-A- -
OQ5CP.....4524- 13-116-A- -
OQ5BB.....4035- 15- 93-A- 9
OQ5RA.....60- 4- 5-B- -

Canary Is.

EA8BK.....5985- 19-108-A-21

Eritrea

MI3AT.....6270- 15-144-B-13

French Morocco

CN8EG.....39,050- 22-594-A-26
CN8AG.....1809- 9- 67-A-13

French West Africa

FF8AG.....67,716- 44-513-A- -

Madeira Is.

CT3AA.....7395- 15-169-B-13
CT3AB.....6840- 24- 95-B- 6

Mozambique

CR7LU.....3996- 18- 75-A-14

Portuguese Guinea

CR5AE.....780- 10- 26-A- 2

Southern Rhodesia

ZE3JP.....67,896- 46-492-A-50

Spanish Morocco

EA9AP.....26,388- 36-245-A-17

(Continued on page 122)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W1VMW

Who:

One evening over twenty years ago, during the winter of 1932–1933, the operator of amateur station K7UT, near Teller, Alaska, was engaged in a friendly chat with another ham in far-off New Zealand. Alaskan winters are notably severe, and a small coke stove was doing its best to dispel chill from K7UT's tiny hut-like shack.

Unnoticed by the occupant, this fire began to permeate the hut with deadly carbon monoxide fumes. Fumes that gradually and insidiously dimmed the operator's consciousness into lethargy and from lethargy into torpor.

The New Zealander, almost as remotely situated as his Alaskan friend — his was a lonely lighthouse shack — listened with aroused curiosity as he heard K7UT's 500-cycle-modulated c.w. signal flag and falter. He was thoroughly alarmed when the familiar fist finally stopped sending entirely.

When K7UT failed to reappear, the Zedder sensed trouble. He gripped his key and tried a long-shot CQ K7. DX fates were kind that night — he had the great good fortune to raise another Alaskan station quickly. Authorities in Teller were notified of the circumstances and within twenty minutes an investigation was under way. K7UT was found unconscious but the rescue party arrived in time to save his life.

* * *

The K7UT in that now-famous episode was Clyde DeVinna, W6OJ, chief cinematographer with the M-G-M motion picture expedition encamped in Alaska for the filming of *Eskimo*. A few years earlier he had won the Academy Award for Cinematography with his outstanding camera work in *White Shadows of the South Seas*.

Amateurs of long standing, and old-time DXers in particular, will regret to note the appearance of Clyde DeVinna's name in this month's Silent Keys. Clyde's amateur activities, in connection with his adventurous travels as a movie photographer, were a colorful part of ham radio in the late twenties and early thirties. *Trader Horn*, *Treasure Island*, and *Eskimo* were outstanding films of the period that saw W6OJ operating "on location" under such calls as FK6CR, BAM and K7UT.

What:

Well, waddaya know — it's Z8 season again! No matter how generally poor conditions get, the autumnal equinox seems to come through with a variety of Africans rarely heard during the balance of the year. Anyway, time should tell . . . . . CE0AA was worked by so many of the faithful that we won't even try to list the lucky ones. Luis was active on 3.5, 7, 14 and 21 Mc. and his technique was perfect for a maximum QSOs-per-hour average. VQ7UU-VQ9UU-YA3UU was in their slugging, too, but unfortunately allowed the gang to make a shambles of his frequencies much of the time. This slowed him down to a walk . . . . . Another delicious one, VQ1RO, was in there pitching later on.

On *twenty* c.w., W8HJK must have his beam pruned on the nose. **CN2**AO (14.015), **CP1**BX (065), **CR6AI** (030), **EA9**AP (005), **FA9**VN (025), **FM7**WD (050), **GC2**FZC (040), **GD3**UB (045), **HA5**BB (010), **HP1**BR (020), **HZ1**AB (020), **KG6**FAA (035), **OA4**N (065), **OE13**USA (010), **SU1**MQ (015), **TA3**AA (045), **TF3**AB (085), **ZC4**IP (015), **ZD2**S (040), **ZD4**AB (010), **4X4**s BN (015), DC (020) and **5A4**TG (075) came back to Jerry's 100-watter . . . . . "Conditions have been fairly good at times," comments YV5FL. Corny bagged **EA0**AB (065), **FF8**JC (050), **MF2**AG (080), **YO3**RF (085), **ZB2**I (085), **ZD2**DCP (022), **4X4**s BX (045) and DK (060), all quite choice . . . . . **CE3**BF (016), **LU4**ZO (029), **VR2**BZ (056), **VK9**YY (021) and **VS1**FZ (018) answered W6YY's beck and call . . . . . W2EBV chatted with **PJ2**AK, **CT2**BO, **HK1**TH, **HR1**s AA (060), KS, **TF3**SG, **VP5**BF (075), **ZB1**BU, **5A1**TM and a 4X4 . . . . . Before he left for a W2-land vacation, W5VIR caught up with **KA0**IJ on Iwo, **OD5**LX (090), **SU1**SS and **9S4**AX. Tex had a nice visit with W2SMR in Newark Valley . . . . . **VK1**BJ (080) on the Cocos told W6LW he knows naught anent ZC3AA. Ballyhooed and delayed DXpeditions provide a fertile field for empty-headed bootleggers . . . . . DL4JN comments on the increase in Hungarian and Roumanian activity and lists recent good luck with **ET2**s AB (020), WW (080), **FQ8**AS (030), **OD5**BH (040), **ST2**AR (075) and **VQ5**RO (040). **HE1**C (065), **LU0**AAW (045), **VQ5**CL (010) and **ZC6**OR (060) were heard. Bill was elected GARC Treasurer and at last count had 121 points toward WAE . . . . . Painting the house, keeping an eye on two harmonics and lawn-mowing chores kept W9ALI down to **DU**s 1WP, 7SV (090), **JA**s 1AA 1CJ 3BB 3DB, **KA**s 2NY 8TB and **KG6**FAB . . . . . **YU2**AJ (020) came back to W3OSP's 7-watt VFO and ground-plane combo, while W4TJI busied himself with **HR1**UA, **PJ2**s AD and CI . . . . . W6ZZ did business with **FO8**AI, **JA**s 1AL 3CA 3WA, **KA**s 2WW and 9FC . . . . . W8NOH grabbed **CR6**CZ (040), and W2LYO made away with **4X4**BN (041) . . . . . **EA8**BF (060), **KX6**BF and an HR1 replied

* DX Editor, *QST*.

Currently leading the European 'phone DXCC pack, Honor Rollee SM5KP blasts out potent signals with this Bromma, Sweden, layout. Licensed in 1938 when 16, Vic now runs a half kw. to 813s modulated by four 811s. The rig bandswitches (except for final tank) from 3.5 through 28 Mc. and six long-wire antennas are available singly or in combination. Some of Vic's DX was worked as SM4KP from a location where he was able to erect two rhombics, three Vees and several Sterbas.

♦

to **W8DLZ**, **CEØAA** and **VQ9UU** gave Norm a rough time . . . . . A full-wave wire and around 50 watts put the finger on **FK8**AA (070), **KR6**K8 (070), **VR2**A8 (070), **ZK3** 1AB (030) and 2AA (030) for 15-year-old W7QDJ. We could use more W7 info . . . . . **GC2**CNC was running a mere two watts when he worked W8JGU. **CR6**CS (061), **KA6**AF (095), **FB8**UU (096), **OX3**GG (041), **SU1**s CN (005), GB (080), **SP1**KAA, **VQ4**s AO (090), PP (067), RF (090), **YO3**RF (025), **ZC4**GF (080), **3V8**AN (065), **4X4**s BD (070). BR (072), several CEs and **VP2**MD (005) were also added to Bill's list . . . . . G3AAT/**OX** (075 t8) tangled with W1JNV while KH6PM encountered one **JZØ**KF (015) who says he's in Dutch New Guinea. The JZØ also said "QSL via ARRL" although we at Hq. haven't yet heard from him. His prefix jibes, at any rate . . . . . W8HEV hasn't been hitting it too heavily, but he managed **FF8**AG, **FQ8**AR, **HK4**FV, **JA1**AB, **SU8**s 1FX 5EB, **UG6**KAA, **VP3**s HAG YG, **VQ8**s 3BM 4DC, **VP1**AA, **VU2**s CG and JG . . . . . W1CKU has a fancy one — G3GDW/**VS7**BH. Must be one or the other! . . . . . **KS6**AB (065) is a nifty logger by WØPRM (ex-DL4LQ) . . . . . The West Gulf DX Club, No. Calif. DX Club and So. Calif. DX Club organs established the 14-Mc. c.w. activity of these DXceptional catches: **AC4**NC (115), **CP5**EK (022), **CR6** 4AJ (080), 4AO (086), 5AA (056), 5AC (010-040), 5BP (185), 8AH (068), 9AF, 9AH (054), **DU1**MP (003), **EA8** 6BF (030), 8AX (105), 9AP (003-034), **ET1**WW (090), **FF8**AX, (070), **FK8**s AB (060), AD (050), **FM7**WF (120), **FN8**AD (049), **FO8**AB (019), **FP8**AP (080), **FU8**AC (020), **I5**s PR (075), ZC (049), **IS1**AHK (001), **KC6**AF (026), **LU3Z8** (050), **LZ1**KAB (020), **MP4**BBD (018), **OD5**s AB (090), LC (085), XX (070), **OE1**3BR (043), **OQ5**s GU (050), NK (082), **OY2Z** (085), **SVØ**WG (015), **TA3**AA (019), **UAØ**KKB (060), **VK8**s 1BJ (110), 1RL (085), 9RM (042), 9WL (025), **VP8**s 2OD (003), 3VN (030), **VR1**A (050-065), **VS6**s 1AU (029), 1DA (082), 1DX (030), 1FE (065), 1FR (025), 1FP (105), 1FT (105), 1FZ (090), 2AZ (085), 2DF (059), 2DW (070), 2DY (085), 6AE (052), 6CG (090), **VU2**s EJ (080), ET (118), JK (020), **XZ2**OM (021), **YI2**AM (063), **YO5**LC (074), **ZA1**KAB (020), **ZC4**s 2MWW (177), 4EP (016), 5VS (085), **ZP5**AY (095), **ZS3**Q (020), **4X4**s DF (048), FW (095) and HQ (011).

Now for *twenty 'phone*. **CR4**AD (14,175), **GD3**IBQ, **HZ1**AB (162), **KJ6**FAA (265), **KS4**AU (210), **KG6**AEX, **M1**B (188) and **VP2**AL (180) go well in W1WQC's log . . . . . **VS2**DY got his 10-watt 6L6 through to W6YY on 14,204 kc. but John shipped him a 14,198-kc. rock to help him clear the W crowd. W6YY also snared A3ers **DU9**VL, **FK8**AO (102), **FO8**AI (015), **HC8**GI (160), **KS6**AB (015), **VK8**s 1HM (172), 9YT (190), **VR4**s 3C, 4AE (192) and still stalks **XZ2**8S (198) . . . . . **HH2**AM, **YN1**EM and **5A2**TZ worked W2EBV, while W1MX (W1UJX operating) mixed it with **I5**s BC (220) and GO (220) . . . . . DL4YK (W3UYH) mentions the observed 'phone activities of **VQ8**CE (185), **UAØ**AB, **UA9**SR (145), **VS9**s AA AG MA and **YO3**AB . . . . . K6BTE unscrambled signals from **DU1**AS (175), **CP5**AB (178), **FO8**AD (140-150), **HI8**WF (197), **KF3**AA (275), **KG6**ABN (240), **KX6**AY (229), **VP3**YG (111) and **VR3**C (178) . . . . . **CR4**AE (180), **KT1**WX (140), **OD5**AO (190), **PZ1**WK (105), **YI2**AM (120) and an HZ1 kept YV5FL hopping . . . . . L. M. Michel recorded the modulation of **AC4**NC (150), **CP5**EK (190), **CR5**SP (190) and **OQ8**DZ (190) . . . . . WGDXC's *DX Bulletin* specifies the availability of 'phones **CR5**AC (156), **CS3**AC (195), **FU8**AC, **GD3**UB (132), **I5**US (220), **MP4**s ABW (173), AJW (118) in Qatar, **OY2Z** (150), **SU1**MI (172), **ST2**NW (190), **VP**s 3YG (200), 5BF (149), **VQ4**AC (170), **VS**s 2BW (135), 2DB (124), 2UW (126), 5AQ (132-320), **ZB1**BR (310), **ZC5**VR in Borneo and **ZM6**AA (342).

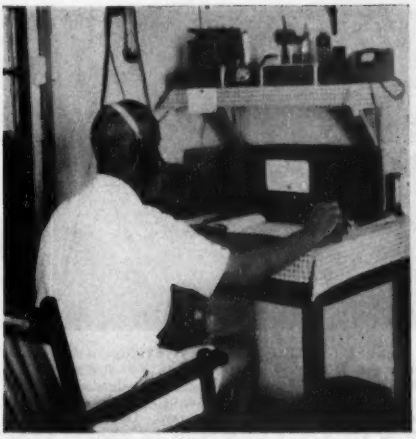
DX life can still begin on *forty*. We see that old 7-Mc. stalwart W2RDK is back at it again from a new location. Among Charlie's recent c.w. trophies are included (times EST) **CR**s 5AC (7020) 1830, 7AD (15), **FF8**AG (10), **GD3**IBQ (10) 1900, **HA7**OL, **IS1**CXF, **KB6**AY, **LU4**ZO (05) 2230, **SU1**FA (18) 1930, **YO6**VG (15) 2200, **ZD1**8S (25) 1915 and **4X4**FQ. That makes it 65 40-meter countries for W2RDK since April . . . . . W1ORP captured **FK8**AO (50) and **LU4Z8** (19), while W6DLM accounts for **KC6**AC (60) who has been appearing regularly around midnight PST . . . . . Ninety 7-Mc. countries is the tally at KP4KD after **3A2**AY, **EA8**BF (15) 0050 and **VR2**CG (25) 1120 — times GCT . . . . . The BC-458 at W5WZQ knocked off **KG6**FAA, **KW6**BB, **KX6**BF, **PZ1**WX, **TG9**MD, **VP5**BH, **YV5**ER and sundry LUs, since midsummer . . . . . **KG6**AEJ, **KW6**BI, **PJ2**s AD CI and **LU3ZO** worked W4TJI, while W2LYO scored with **PI1L8**, **PJ2**CE (24), **LUØ**AAW (13) and **VP8**AJ (08) . . . . . WØPRM is out to trap **ZK1**AB (05), and W5ONL is raising some pretty good DX — KZ5 KP4 OK1 ON4 and TI2 — with his 75-watt mobile near school in Alabama . . . . . The aforementioned three live-wire club groups nominate **C3**BF (10), **FK8**AB (25), **FO8**AI (23), **UM8**KAB, **VK1**s BA (20), EM (31), RL (15), **ZC6**DU (10), **ZD6**DU (05) and **ZS9**I (05) as eligible 7-Mc. c.w. candidates.

As for *forty 'phone*, this line from W1BSY: "During a 20-meter 'phone QSO on June 28th with **TA3**AA the question arose as to what 40-meter 'phone would do over the same path, and a quick QSY, with TA3AA operating on 7157 kc., revealed that he was 86-8 on 40." . . . . . **CN8**FW (7275), **KP4**UH and **VP9**BK (7295) were QSOd amid the jammers by W1APA. Cil now has his near-kw. 810s final tightly buttoned up against TVI.

W1ORP braved the hot-season atmospherics on *eighty c.w.* to work **CO5**PN, **EI9Q**, **FP8**AP, **G8JR**, **KP4**KD **PAØ**VB, **VK3**FH (3508), **ZL**s 1ADU 1ADX 1AH 1CI 1HM 1LM 2G8 3GQ 3GU 4BO 4IE and ship **SM8**ACX out of Hoboken. Ed has been stalking **VR2**CU who regularly works **ZL**s around 3543 kc. . . . . Among others, **CEØ**AA worked W6ZOL and W3FQB on 3.5 Mc. . . . . Eighty wasn't such bad medicine for KP4KD during the noisy months. **CE4**AD (05) at 0143 GCT, **EI9J** (03) 0120, **HB9**KP (03) 0109, **LU1**EP (05) 0035, **OK3**MM (05) 0105, **OZ2**PA (05) 0045 and **SM6**ACO (03) 2345 helped bring Ev up to 45 3.5-Mc. countries.

KP4KD has been cracking down on *fifteen c.w.*, too. **OD5**BH (21,030) at 1755 GCT, **SU1**GG (030) 1851, **ZB1**BJ (015) 2100 and **ZP9**AY (030) 1930 brought him to the 60th 21-Mc. rung. **FF8**AG, **KV4**BB, **VQ4**RF, **4X4**BX and **9S4**AX were others salted away . . . . . **ZB1**AI (030) contacted DL4JN. Many of the gang found fifteen meters the easy route to Easter Island's **CEØ**AA.

We'll let *fifteen 'phone* wind up this month's band-by-band dissertation. W6ZZ's QSO with **HC1**MB made it 46 21-Mc. countries for Miles. He also nabbed **HR1**JM, **HP3**FL, **KV4**BD, **OA4**C, **ZL1**s BY and GW. Incidentally, W6ZZ has 40 states to his 15-meter A3 credit . . . . . The best of the lot at DL4JN was **VQ4**BU (21,300).



An 807 30-watter and a Windom skywire are sufficient to provide MP4BAF much entertainment on DX bands. Located at Manama on Bahrain, operator J. A. Faithful often teams up with Awali's MP4BBD to go a-hunting W/VEs between 0200 and 0300 GCT. MP4BAF's QRP set-up on 14-Mc. c.w. competes well with MP4BBD's 150 watts and ground-plane.

Where:

DL1KV reports that DARC will relay QSLs bound for newly-ticketed DM2 Eastern Germany stations. Cards may also be sent by way of DM2ABL, Leipzigerstraat 14, Dresden, Germany (see "Tidbits") . . . . . W8HEV may be able to confirm with QSLs many FM7WD/FM8AD QSOs and he offers the possibility of such service particularly to those who have never salted away Martinique pasteboards. Full QSO data must accompany requests sent W8HEV; those that do not jibe with FM7WD/FM8AD log info on hand will be passed along to FM7WD, himself. Also, return postage must accompany each application. W8HEV's up-to-date mail QTH: Thomas J. Woodward, 13510 Rutland, Detroit 27, Mich. . . . . VS2CC is now handling Malaya QSL Bureau chores at P. O. Box 600, Penang . . . . . W2AOS/KG6 advises mainland amateurs to use nothing but air mail when QSLing stations located on the more remote Pacific islands. The transit-time differential is more than appreciable . . . . . As specified in last month's ARRL QSL Bureau roster, Ernest Ash, VO1A, P. O. Box 8, St. John's, has taken over Newfoundland (and all VO) duties.

CN8EY, (QSL via K2BAS)
CR8SP, (QSL via CT1CL)
FA8GO, (QSL via REF)
FB8UU, (QSL via REF)
FF8AG, (ex-FE8AB-FQ3AT; QSL to F3AT)
I5FT, Box 173, Mogadishu, Italian Somaliland
ex-JA2AB, M/Sgt Walt Buhr, Hq. 1872nd AACS Sqdn., Andrews AFB, Washington 25, D. C.
K2ACP/KG6 F. B. Norris, % U. S. Naval Communication Station, Navy 926, FPO, San Francisco, Calif.
ex-KM6BG, Ross Cade, 1756 Roll St., Santa Clara, Calif.
KP4VB, R. L. Hatfield, N-16-B, San Patricio, P. R.
KS4AU, Jim Price, Swan Island, via Postmaster, Tampa, Fla.
KZ5TH, P. O. Box 407, Balboa, Canal Zone

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Elsewhere in this *QST* you'll find that PY4IE, Belo Horizonte, Brazil, piled up the peak PY c.w. score in 1953's ARRL DX Test — despite plenty of local QRM put out by his seven youngsters cavorting in the background. PY4IE is anxious to maintain a 100 per cent QSL record and has given many DXers assists toward WAB and WAPY awards.

LU6DEM, Jose M. Francisco, Nelson Radio Service, 970 Mitre St., Canuelai, Argentina
MP4ABW, (QSL via MP4KAC)
OD5LX, P. O. Box 1217, Beirut, Lebanon
PJ2AN, Arie Dikken, P. O. Box 9, Aruba, N. W. I.
ex-PK1TM, J. Bakker, Bemmelseweg 64, Elst. O.B., Netherlands
ST2UU, P. O. Box 801, Khartoum, Sudan
SV0WE, Andy Sweder, APO 206, % Postmaster, New York, N. Y.
VK1HM, Chas. Holman, % Dept. of Civil Aviation, Cocos Islands
VK9YY, Box 13, Lae, New Guinea
VP6GT, Geo. Taylor, Black Rock, St. Michael, Barbados
VP9BO, (QSL via RSB)
ex-VR3A, (QSL to VK9RG)
VS1FT, Box 176, Singapore, Malaya
W4ROK/KG6, J. R. True, % U. S. Naval Communication Station, Navy 926, FPO, San Francisco, Calif.
XE3AH, Rodolfo Dias C., 27 St. num. 121, Progreso, Yucatan, Mexico
YA3XY, (QSL to JY1XY)
YN1OC, Box 483, Managua, Nicaragua
YS1ZA/AM, (QSL to YS1ZG)
YS1ZG, USAF Mission to El Salvador, % American Embassy, San Salvador, El Salvador
YS1ZM/M, (QSL to YS1ZG)
ZC4IP, G. F. Barrett, P. O. Box 219, Limassol, Cyprus
ZK1BG, (ZL2AJT; QSL via NZART)
ZP5FI, % American Embassy, Asuncion, Paraguay
ex-ZP7AW, (QSL to ZP5DC)
ZS2EO, Gerald B. Smith, Postal Staff, Graaff-Reinet, South Africa

Note: 8U1CN, VQ7UU, VQ9UU, VS2UW and ZC4GF — QSL via RSGB bureau.

For the preceding, kudos due W1s APA HA JCX ORP RB, W2s AOS/KG6 CWK GT, W6s UJ ZOL ZZ, W8s JGU NOH, W9s CFT PWU, K2CD, KH6PM, KP4KD, W. F. Huntemann, L. M. Michel, Roy Waite, No. Calif. DX Club *DXer*, So. Calif. DX Club *Bulletin* and WGDXC *DX Bulletin*.

Tidbits:

Asia — The U. S. A. has had its weather difficulties this year but we hold no monopoly on overly-brisk breezes. From an AP2N letter to W9FKC: ". . . The temperature in Karachi rose to 116° with 88 per cent humidity — it was like living suspended in hell. On the evening of the third day of this, the sky clouded up and . . . it started to rain spasmodically. Suddenly a twister hit the town from the southeast. . . . My 400-lb. beam and tower were lifted off the terrace like they were made of papier-mâché and they crashed into the office yard 60 ft. below. Of course, it was smashed to smithereens. Fortunately, nobody was below it when it crashed. So there endeth my pride and joy and I will have to see what I can do with a dipole again." . . . . . Old-time ARRL staffman W4IA is really perambulating on DX bands now as KA2AW. Although "never a real DXer" Ev regularly amazes himself at the way 45 watts and a ground-plane can cut the 14-Mc. cheese . . . . . Formosan notes from W2AOS/KG6: C3BF will remain active at Taipei for an indefinite period and has a new 75-watter going on 7 and 14 Mc. — QSLs still go via W1WAY. . . . W2DX may be putting his new C3 call on DX bands as you read this . . . . . L. M. Michel finds that JY1XY, whose QTH is okay in the *Call Book*, frequently gets an opportunity to put YA3XY on the air. No need to insult your intelligence by stating that YA is Afghanistan and that Afghanistan is rare . . . . . HS1WR dropped in on W6YY while

on his way back to Siam after Point Four schooling hereabouts. Said he'll see what he can do toward lifting the official Thailand frown on hamming . . . . . There could be some Israeli activity on 160 this season. KP4KD was told by 4X4RE that Israel may soon authorize the band's use by amateurs. This would make Low Band Asians all the more workable . . . . . V82DB writes that V82s BD BS CP DB DF DL DQ and UW all intermittently inhabit the 20-meter 'phone region. Kuala Lumpur, a location famous in the early history of short-waving, is represented consistently by V82DB, himself.

Africa — W2GT passes along word of possible October Rio de Oro activity. EAs 2CA 2CQ 4BH and 8BI are getting things organized for such a southward thrust . . . . . KP4KD finds that EA8BF, back from a 6-month sojourn in Spain, is sweating out quite a backlog of accumulated QSLs. Ev also learned that FF8AG (ex-FE8AB-FQ3AT) is heading back to F3AT once more . . . . . Old-timer CR6AI is on the 14-Mc. lookout for Idaho, Mont., Nebr., Nev., Okla. and Utah contacts around 1700 GCT, 'phone or c.w. . . . . One wonders what goes on in Libya. A short while ago amateurs there popped out with 5A1 calls when 5A2 and 5A3 prefixes were the rule. Now here come several 5A4 stations to join the fun . . . . . To stem queries on Uranda Urundi, now well represented by very active OQ9DZ, may we restate that OQ9, like IT1, is not on the DXCC Countries List . . . . . Dark Continental notes from the WGDXC *DX Bulletin:* 8T2NW is leaving the Sudan. . . . FB8UU, VQ7UU, VQ9UU and 8T2UU, same guy. . . . CR5s AA and AC have 50-watters on 14,056- and 14,156-kc. c.w., respectively, with the latter scheduled soon to go QRO; CR5AD's activity is close to nil.

Oceania — VK9YT remarked to W6YY that he is the sole New Ireland station active at this time. His on-the-airing is limited by the high cost of generator fuel. VK9YY also states that Norfolk Island is currently bereft of ham activity . . . . . If you still need a card from PK1TM, try the QTH suggested by W2GT in "Where." Don't neglect to include *full QSO data* with your application . . . . . Oceanic notes through W2AOS/KG6: KC6AC puts Truk on the air with a 7-Mc. 50-watter. . . . KC6AA (ex-W9ENT-KH6ANZ) regularly makes Yap QSOs available with 650 watts and vertical antennae on 20 and 40. . . . W4ROK/KG6 and K2ACP/KG6 are new Guam regulars who have 500 and 20 watts, respectively, on 14 Mc. . . . Contrary to picture-caption implication last month, W2AOS/KG6 does not work 80 meters. No doubt he'd like to give it a try, but 3.5-Mc. hamming is not permitted thereabouts . . . . . Although he strove to QSL 100 per cent, KM6BG is willing to answer QSL inquiries if addressed to the QTH given in "Where." Replete QSO data is a must . . . . . The Moorabbin (VK3) Radio Club certificate, mentioned some time back, was finally earned by a W. W6YY turned the trick . . . . . DXCC is fattening up its own Countries List. W1WPO finds that ZK2AA just collected the first and only Niue membership . . . . . L. M. Michel and W6YY find that K8AB intends much Samoan activity of the A3 variety . . . . . There's a story behind ZL2AQG. Ray, a plucky shut-in, earned his ticket the hard way and is a "favorite son" of the Down Under gang with his "Beacon Light Station" in the port city of Napier . . . . . From SCDXC's *Bulletin*, on Oceanian shenanigans: FW8AB has a VFO 70-watt 807s rig ready for c.w. action on Wallis Island. . . . ZL3JA still contemplates ZM7 operation on Tokelau. . . . VR4AE intends more c.w. work around 1000–1100 GCT. . . . Orchids to W6MUR for undertaking heavy ZK2AA QSL chores. . . . From Jan. 25 to Mar. 5, 1953, FO8AI was land-based in the Marquesas. It was a shipboard deal at times before and after, a bad DXCC break for some.

VS6BE sports this neat Hong Kong installation and is now at work building a new 813 transmitter patterned after circuitry in the 1953 *Handbook*. With TV surging far and wide, Lyle intends to get a good jump on the TVI situation. (*Photo via W6YY*)

KR6LL (right) and KR6LW talk things over in a lull between DX sessions at the KR6LL shack. Glenn, KR6LL, had just put the finishing touches on the console when this picture was taken. Gear in view includes a BC-610, BC-614E speech amp, HRO-5TA-1 and Super Pro. KR6LL QSOd nearly 100 countries during his tour of duty on Okinawa.

Europe — DM2ABL, Dresden (Russian-occupied Germany), asked W1HA to pass along word that these DM2A calls have been issued: BB BH BJ BL BM BN CB CH CJ CL CM DH DM EM FB and GM. Others will soon be on, and DM2ABL has been hitting 7 Mc. with a potent c.w. signal. Check "Where" for DM2 QSL data . . . . . W3JAK (DJ1JA), still studying in Stuttgart, contemplates a tour through HB9 F 3A2 I1 HV MF2 YU and OE territories but says nothing about possibly hamming in those spots. Flav's Stuttgart schoolmates include LAs 2LC 5CB and DL6TV.

South America — CE9AA, one of that small percentage of rumored DXpeditions that successfully makes the transition from pure hearsay to cold fact, was worked by the multitude on 3.5, 7, 14 and 21 Mc. CE3AG's voyage to Easter took about two weeks and one interesting stop contemplated for the *SS Angamos* was Juan Fernandez Island, a site famous as the locale for Defoe's *Robinson Crusoe*. If Mr. Alexander Selkirk had been a ham — and had there been hams at all in those days — his time as a castaway would have passed quickly, indeed . . . . . Would-be amateur T. H. Alleyne, % Trinidad Leaseholds Ltd., Point-a-Pierre, Trinidad, has need for used electronics literature and will gladly arrange some type of exchange . . . . . W4J88 found that Caribbean-area amateurs often shy away from the DX game because of the high cost of QSLing and the high-pressure QRM. He suggests IRCs or appropriate postage *always* be sent them for return QSLs . . . . . Merchant-mariner LU6DEM gave up his sea legs upon marriage and is now an enthusiastic landlubber amateur. He looks forward to working many Ws — watch for LU6DEM on 7075 kc., 'phone and c.w.

Hereabouts — HP1BR, who still runs 100 watts to an 813, has been receiving QSLs for QSOs not accounted for in his log. Most of them are for 7-Mc. work and Bob regrets to have to disappoint so many stations by returning their cards unanswered. He adds: "There seem to be more HP hams on daily and, what with the KZ5s working down to 14,150 kc., the QRM is worse than ever." . . . . . Too late, Jeeves — a good W9 call sign has left the inactive ranks. Louis J. Patla, who held the call W9DX back in '34, has it back again and is planning both c.w. and 'phone activity on 20 and 40 meters. Son Don is out after his own ticket as well.

The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* W1HDQ

If you've been holding back on 50 or 144 Mc. because of a location that is ringed around by high mountains, take heart from a paper in the current *IRE Proceedings*.[1] This confirms what some enterprising v.h.f. hams have long suspected; that high mountains along a path are not necessarily an insurmountable hazard. In fact, they may be a distinct help.

An Alaskan instance is cited, where 38 Mc. is used on a 160-mile path directly over Mt. Fairweather, whose 8775-foot ridge behaves like a knife edge. Situated near the midpoint between two stations that are but a few hundred feet above sea level, it causes diffraction that reduces the transmission loss by 73 db. compared to what could be expected on a smooth-earth path of the same distance. Other cases in Hawaii, Japan and our own Rockies have supplied evidence of the benefits of suitably-situated high ridges.

The ideal case is probably that of a sharp ridge perpendicular to the signal path, and of such height that the normal radiation pattern of the antenna system grazes the ridge top, but large modifications of this ideal may still produce an "obstacle gain" and make possible communication over paths that appear impossible when considered in the light of older propagation notions.

We have reported several instances where hams, inadvertently perhaps, have made use of this knife-edge diffraction. W7LEE, Parker, Arizona, has demonstrated that he can work into Los Angeles regularly on 144 Mc. To look west from his antenna site, 450 feet above sea level near the Colorado River, or east from the western end, you'd never dream that 2-meter signals would get over the 240 miles of mountains in between. But they do, regularly, and well. In view of the information in the paper mentioned above, this path is probably better than if there were nothing but Midwestern plains between the Colorado River and the Pacific Ocean!

Mountains can be helpful to v.h.f. enthusiasts in other ways, too. Our record book contains many examples of isolated peaks or high ranges of mountains serving as reflectors. Peaks like Mt. Rainier in Washington or Mt. McKinley in Alaska provide reflection surfaces from which v.h.f. signals bounce into low valley locations. The requirement here is, of course, a peak that rises sharply above surrounding terrain, so as to be visible from the two stations concerned.

Mt. McKinley is ideal in this respect, rising higher above its local environment than any other mountain in the world. Ken Bowles, W2MTU, spending the summer at the Geophysical Institute of the University of Alaska, writes that reflection from Mt. McKinley makes possible solid 50-Mc. communication between College and Healy, Alaska, a 100-mile path that is almost hopeless on lower bands because of the frequent auroral disturbances. A 300-mile haul to Anchorage is also covered via McKinley's slopes, and CAA

50 WAS Mc.

WØZJB	48	W5VY	48	W8OJN	39
WØBJV	48	W5MJD	47	W8LPD	37
WØCJS	48	W5GNQ	46		
W5AJG	48	W5ONS	45	W9ZHB	48
W9ZHL	48	W5JTI	44	W9QUV	48
W9OCA	48	W5ML	44	W9HGE	47
W6OB	48	W5JLY	43	W9PK	47
WØINI	48	W5JME	43	W9VZP	47
W1HDQ	48	W5SFW	43	W9RQM	47
		W5VV	42	W9ALU	47
W1CLS	46	W5FAL	41	W9UIA	45
W1CGY	46	W5FSC	41	W9UNS	45
W1LLL	46	W5HLD	40		
W1LSN	44	W5HEZ	38	WØQIN	47
W1HMS	43	W5LJU	37	WØDZM	47
W1DJ	41	W5FXN	37	WØNFM	47
				WØTKX	47
W2AMJ	46	W6WNN	48	WØKYF	47
W2MEU	46	W6ANN	45	WØHVW	45
W2RLV	45	W6TMI	45	WØMVG	44
W2IDZ	45	W6IWS	41	WØJOL	44
W2FHJ	44	W6OVK	40	WØTJF	44
W2GYV	40	W6GCG	35	WØWKB	43
W2QVH	38	W6BWG	29	WØJHS	43
W2ZUW	35			WØPKD	43
		W7HEA	47	WØIPI	41
W3OJU	46	W7ERA	47		
W3NKM	41	W7BQX	47	VE3ANY	42
W3MQU	39	W7FDJ	46	VE3AET	41
W3RUE	37	W7DYD	45	VE1QZ	34
W3OTC	36	W7JRG	44	VE1QY	31
W3FPH	35	W7BOC	42	XE1GE	25
		W7JPA	42	CO6WW	21
W4FBH	46	W7FIV	41		
W4EQM	44	W7CAM	40	Calls in **boldface** are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on unverified reports.	
W4QN	44	W7ACD	40		
W4FWH	42				
W4CPZ	42	W8NSS	46		
W4FLW	42	W8NQD	45		
W4OXC	41	W8UZ	45		
W4MS	40	W8CMS	43		
W4FNR	39	W8YLS	41		
W4IUJ	38	W8RFW	41		
W4BEN	35	W8BFQ	42		

* V.H.F. Editor, *QST*.

[1] Dickson, Egli, Herbstreit and Wickizer, "Large Reductions of V.H.F. Transmission Loss and Fading by the Presence of a Mountain Obstacle in Beyond-Line-of-Sight Paths," *IRE Proceedings*, Aug., 1953, p. 967.

is making use of mountain reflections over several other long v.h.f. links in Alaska.

So — though it is undoubtedly fine to have a ham shack on the top of the highest hill in the area, if you, like so many of the rest of us, are forced to accept something less, don't be too readily convinced that v.h.f. is not for you. Those mountains in the distance may be one of Nature's boosters. You'll never know until you try.

900 Miles Regularly on 144 Mc.?

No, we're not pipe dreaming — it's actually happening. The signal is nothing you'd want to use for a casual ragchew; in fact, little intelligence other than station calls has been transmitted successfully in either direction so far, but this much has been exchanged on several occasions. Partially identifiable signals have been recorded night after night.

It all started about two months ago, when, as reported in August *QST*, W4HHK, Collierville, Tenn., started hearing bursts of signal on 144 Mc. from W4AO, Falls Church, Va. As W4AO was going to be off the air for a month or so, Paul arranged tests with W2UK, New Brunswick, N. J., to see if the feat could be duplicated with any degree of regularity. Tommy transmitted nightly on c.w. with his kilowatt rig, feeding a 40-element array 85 feet above ground. Paul, listening on a 32-element job at about the same height, heard identifiable bursts the first night, and has picked up something every schedule since.

The bursts were generally of short duration, having the characteristics associated with meteor reflections. Only a few characters came through at a time, so W4HHK reasoned that high-speed keying might make possible somewhat more solid copy. W2UK then put on automatically-keyed c.w., at speeds from 40 to 60 w.p.m. Paul recorded whatever came through, and then played the tape back at reduced speed. Under these conditions somewhat better copy was received, though it was still too fragmentary to be useful for exchanging random information.

W5RCI, Marks, Miss., has also heard the signals from W2UK and W2AZL, who joined the project shortly after the initial schedule. Both W2s have been identified by W4HHK and W5RCI, and both the latter have been copied at the New Jersey end.

Just how far this circuit is below solid communication is anybody's guess, but if the mechanism here is similar to that employed in the Cedar Rapids-to-Washington circuit on 49.8 Mc., it appears that another 10 db. might put the boys in business. That 10 db. wouldn't come easily, as their set-ups are already close to the practical limit of amateur techniques, but that won't keep them from trying. Whatever the end result, the work being done by all hands is in the best amateur tradition. With the moon-reflection work of W4AO and W3GKP, it ranks as one of the outstanding ham radio stories of the times.

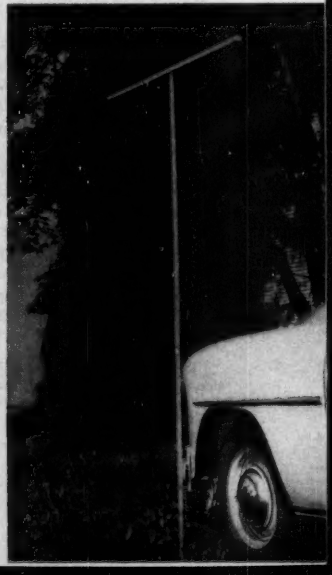
2-Meter Mobile Enjoys a Boom

Civil defense requirements and the several commercial rigs now on the market to serve them have resulted in something of a boom in 2-meter mobile operation. This is not so much mobile (in the sense of built-in equipment, operated while the car is in motion) as it is portable work. The 2-meter station built into a car, and usable in no other way, is still a rarity, but gear that can be used either on the car battery or on a 115-volt a.c. supply is becoming more popular every day. Obviously, an antenna that can be installed on the car and removed readily is very useful in these varied applications. A couple of demountable no-hole-in-the-car antenna ideas are shown herewith.

The first one was cooked up on the spur of the moment when your conductor decided to take one of these universal 2-meter rigs along on the trip to the National Convention. The mount could hardly be simpler — a coaxial fitting attached to a small strip of aluminum, bent so as to slip into the crack between the inside beading and the main frame of the car window. The sponge-rubber weather-stripping in the car door flattens out around the aluminum strip and the coaxial line when the door is closed. Pressure against the mounting plate holds it in position, and the plate can be bent slightly after it is in place, to align it exactly vertical. By leaving a small amount of slack in the coax, the mount may be left in place as the car door is opened and closed. It can be detached and stowed away in less time than it takes to tell, leaving no trace of the mobile "installation" it serves. The whip can be removed from the fitting and used with the portable rig wherever a.c. is available for its operation, as in overnight stops.

Then just the other day, W6RLB paid us a visit at Headquarters, exhibiting a rooftop mount that is ideal for the fellow who wants this effective type of mobile antenna, yet quakes at the thought of drilling a hole smack in the middle of the top of the family car. This is not quite as detachable as the first suggestion, but it is probably a better antenna, as it can be put in the center of the car top.

As may be seen, it is made from the top of a tin can, a sheet of flashing copper and two coaxial fittings. One fitting is mounted in the top of the can, another in the side, and the two inner conductors are connected together inside the



(*Left and center*) Two no-holes antenna mounts for 2-meter mobile. At the left is a simple detachable mount that fits into the crack between the beading on the door and the window frame. The bracket and the small-diameter coaxial line are held firm by the rubber weatherstripping when the door is closed. (*Center*) A mount for use in the center of the car top is shown. Its main components are a tin can and two coaxial fittings. The base plate is fastened to the car top with plastic tape. W6RLB is responsible for the idea. (*Right*) A demountable fold-up array for 2-meter portable work. Elements of aluminum ground wire fold back along the boom for storing in the car. The half-yoke match is the brain child of W1IXJ, who has used the system effectively in arrays on lower bands.

assembly. The can is cut about an inch high with three or four tabs extending a half inch or so for soldering to the copper sheet. The sheet is then fastened to the car top with plastic tape.

No direct electrical contact is needed between the plate and the car top, as the capacitance between the two simulates an actual ground connection. As a protection against scratching the car top, the bottom surface of the plate may be covered with the same plastic tape. If a lightweight whip is used, a strip of ½-inch tape around the edge of a 4 by 6-inch plate will hold the assembly firmly in place for months. Both the whip and the coaxial line may be detached for other uses whenever they are needed.

A quarter-wave whip leaves quite a bit to be desired, if one is interested in covering appreciable distances from ordinary locations, so many mobile enthusiasts take along knock-down arrays for use whenever a few minutes' time can be spared to set them up. A method of making this sort of thing is shown in a third photograph. The idea for the matching system in this job should be credited to W1IXJ, who has used it on lower-frequency amateur bands for several years.

Paul calls his brain child the Half-Yoke Match, and the basic idea is obvious from the photograph. Dimensions of the folded-dipole side of the driven element can be worked out from the *Handbook* nomogram for folded dipoles, if the center impedance of the system is known, except that this impedance figure must be divided by two. The outer conductor of the coaxial line is connected to the center of the driven element. The system is a natural for all-metal arrays, though our portable job uses a wooden boom.

For the portable application the elements were made of soft aluminum clothesline or TV ground wire, held in place in the boom by wood screws. When the array is dismantled for traveling, the elements fold back against the boom and the thing can be stored in a space not much larger than the boom itself. If an element breaks after a dozen of these bending and straightening cycles, there is no great loss, as the whole array can be duplicated for less than a dollar.

With this haywire installation, we've worked distances of a hundred miles or so from elevated locations, using only a watt or two of power output. In one instance not a signal could be heard with the vertical whip, but several were audible with good strength on the portable beam.

A 2-meter mobile/portable that has provided a vast number of "Vermont contacts" for the 2-meter gang of W1, 2 and 3 is W2FBR/1. Operating from Mt. Equinox, Manchester, Vt., Ralph and Lee (W2FBZ) have worked more than 50 different stations in two expeditions this summer. Their rig runs up to 75 watts to a 6146 in the final, and can be operated in motion, or in a fixed position with a demountable 8-element array that is arranged for vertical or horizontal polarization.

Reports from California, always a leading mobile region, indicate that mobile activity on 144 Mc. is at an all-time high this year.

Here and There on the V.H.F. Bands

The summer of 1953 will go down in history as one of the strangest 50-Mc. DX seasons on record. May produced almost nothing, and June was such a disappointment that before it was over some of the gang who must depend on DX entirely for their interest in the band had given up completely. Then July turned out to be quite good, with a couple of openings that were on a par with the better sessions of previous years. W5SFW, Amarillo, Texas, found the band open on 18 days in July, and W6ABN, Long Beach, Cal., caught openings on 15 days. Fairly good DX continued well into August. Better late than never, but it's not so good for the activity that way!

It was a tough year for WAS hunters, with many states not showing up at all. W5SFW says that he heard nothing from Louisiana, Alabama, Vermont, North Dakota, Wyoming, Nevada or Utah the entire summer. Montana moved off the very-rare list, thanks to W7CJN and W7JRG, Maine, represented by W1PWW, put W5MJD into the 47-worked class. Joe now lacks only Vermont. Nevada and Utah were the stumbling blocks for scores of operators in many parts of the country.

For the 2-meter gang, August provided some good sessions of tropospheric bending. The 11th and 12th were hot for the Middle West and South. W4HHK reports that his first inkling of what was getting under way came when he heard W8BFQ (a frequent tip-off) at 1923 CST on the 11th. From 1930 on he was busy, working W4PCT, W8s BAX BFQ DX KAY LAH LPD HOH WXV, W9ORZ, W9VUL, VE3AIB, VE3DNX and W2ORI. W2UK and W2FBA were heard, the latter apparently by meteor scattering. This touched off an all-night session, during which W2UK and W4HHK exchanged calls frequently, but never with conditions holding long enough for an exchange of much else, though each heard the other calling again and again. They continued attempts until 0812 EST the follow-

(*Continued on page 118*)

2-Meter Standings

	States	Call Areas	Miles
W1HDQ	18	6	850
W1IZY	16	6	750
W1RFU	15	7	1150
W1MNF	14	5	600
W1BCN	14	5	580
W1DJK	13	5	520
W1CTW	12	4	500
W1KLC	12	4	500
W1MMN	8	5	520
W2UK	22	7	1075
W2NLY	22	7	1050
W2QED	18	7	1020
W2AZL	18	7	1050
W2ORI	18	7	830
W2PAU	16	6	740
W2QNZ	14	5	400
W2UTH	13	7	880
W2SFK	13	6	—
W2DFV	13	5	350
W2CET	13	5	405
W2DPB	12	5	500
W2FHJ	12	5	—
W3RUE	20	7	760
W3QKI	20	7	820
W3NKM	19	7	660
W3KWL	16	7	720
W3LNA	16	7	720
W3FPH	16	7	—
W3GKP	15	6	650
W3OWW	13	6	600
W4HHK	22	7	850
W4AO	20	7	950
W4JFV	18	7	830
W4MKJ	16	7	665
W4OXC	14	7	500
W4IKZ	13	5	650
W4JFU	13	5	720
W4CLY	12	5	720
W4JHC	12	5	720
W4OLK	12	5	720
W4FJ	12	5	700
W4UMF	12	5	600
WN4WCB	9	4	650
W4LRR	5	2	900
W5RCI	16	5	790
W5JTI	14	5	670
W5QNL	10	5	1400
W5CVW	10	5	1180
W5MWW	9	4	570
W5AJG	9	3	1260
W5ML	9	3	700
W5ERD	8	3	570
W5ABN	8	2	780
W5VX	7	4	—
W5VY	7	3	1200
W5FEK	7	2	580
W5ON8	7	2	950
W5FBT	6	2	500
W5IRP	6	2	410
W5FSC	6	2	500
W5DFU	5	2	275
W6PJA	3	3	1390
W6ZL	2	2	1400
W6WSQ	2	2	1390
KG6AAV/6	2	2	275
W6NLZ	2	2	237
W6GCG	2	2	210
W6EXH	2	2	193
W6ZEM/6	1	1	415
W7LEE	3	2	240
W7YZU	3	2	240
W7JU	2	2	140
W7JUO	2	2	140
W7RAP	2	1	165
W8BFQ	24	8	775
W8WJC	23	7	775
W8WRN	20	8	670
W8WXV	19	8	1200
W8UKS	18	7	720
W8DX	17	7	675
W8EP	17	7	—
W8WSE	16	7	830
W8RWW	16	7	500
W8BAX	16	7	655
W9EHX	23	7	725
W9FVJ	22	8	850
W9EQC	21	8	820
W9BPV	20	7	1000
W9UCH	20	7	750
W9LF	19	–	—
W9WOK	17	6	600
W9ZHL	17	6	—
W9MBI	16	7	660
W9KLR	16	7	—
W9BOV	15	6	—
W9LEE	14	6	780
W9FAN	13	–	680
W9UIA	12	7	540
W9GTA	11	5	540
W9JBF	10	5	760
W9DSP	10	4	700
W9EMS	23	8	1175
W8GUD	22	7	1065
W9IHD	18	6	725
W8ONQ	17	6	1090
W9INI	14	6	830
W9ZJB	12	7	1097
W9OAC	12	5	725
W9WGZ	11	5	760
W9JHS	9	3	—
W9HXY	9	3	—
VE3AIB	17	7	850
VE3DIR	14	7	790
VE3BQN	13	7	790
VE3BPB	12	6	715
VE3AQG	11	7	800
VE1QY	11	4	900
VE3DER	10	6	800
VE2AOK	6	2	340

Operating News

F. E. HANDY, W1BDI, Communications Mgr.
R. L. WHITE, W1WPO, Asst. Comm. Mgr., C.W.
PHILLIP SIMMONS, W1ZDP, Communications Asst.

GEORGE HART, W1NJM, Natl. Emerg. Coördinator
ELLEN WHITE, W1YYM, Asst. Comm. Mgr., 'Phone
LILLIAN M. SALTER, Administrative Aide

The '53 Simulated Emergency Test. In October the League supplements the equipment-testing features provided by Field Day by arranging with Emergency Coördinators and Radio Officers to spark-plug a special test, generally known as the SET. Telephoned directions, meetings, special notices, and standing procedures are and should be used to mobilize and activate community drills. The October test stresses organization and operating. Last year, more than ever before, most tests revolved about civil defense. A point system has been utilized by which a particular community or group can test its own efficiency in a test compared to what it did the preceding year. Such is not a comparison with results in other communities where the community size and shape of the problem may be different, of course. The 1952 point-total was 28,515, exceeding the preceding year's point-total of 24,114. Scores of Emergency Coördinator radio reports are sent ARRL in these tests and thousands of messages passed from participants to their ECs indicating individual readiness and activity. Your individual effort should be added to such a test *this* year! The total participation of 3012 in '52 included 1553 mobiles and portables in the exercises with 2416 stations on emergency power. The tests have a double value: improvement through critiques on results, and the demonstration of our potential emergency service to the public. About 20% of all the groups reporting *last* October bettered their previous year's score.

In addition to the testing of emergency plans and facilities, Emergency Coördinators are urged to make this time one for a sort of Annual Roll Call of AREC members and a report on the status of RACES and RACES planning in their areas. Each community's civil defense director (or Communications Officer representative) should be contacted; if, as yet, he has no Radio Officer appointed (contemplated under FCC's FCDA-approved Rules for RACES) the availability of individuals for such appointment and advantages in having this stand-by facility built up to its best level of efficiency and availability should be pointed out without delay. The details of a RACES article in last April, 1953, *QST* should be made available, if there is any lack of information of the subject of how to proceed!

In any event every community should be represented by amateur radio emergency-communication coverage. Get lined up with your local Emergency Coördinator as an AREC member so you will be sure to be called upon. Ask him now what plans are being made for the October 3rd and 4th local test.

Code Classes and Theory Instruction. With the coming of the fall season many clubs are setting up their code and theory classes for the benefit of newly interested members. ARRL has an outline of Suggestions for a Radio Course, and a Reference Guide for those studying code, these items available on request by club officers. The Delaware Valley Radio Assn. (Trenton) has twenty students in its first group reported to ARRL this year. W2DOX, W2FPT and K2ART are instructors, and the rule is followed that anyone missing three classes in a row is dropped back into the next group so as not to hold back the rest of the class which will be fully ready for the WN exam in 16 weeks. The DVRA work encourages those interested to practice code at home between instruction nights; it supports the needs of the Trenton Civil Defense Council for communications-skilled personnel as well as a continuing live-wire club.

Affiliated Clubs. ARRL entered 1953 with 714 affiliated clubs on the active lists compared with 688 a year before. Forty-nine new clubs were affiliated in '52 and 23 clubs had been affiliated by the end of March, 1953. Club dues run as high as $12 per member per year for some clubs and also as low as 50¢ per year. The "average" club continues to have about 30 members and the percentage of ARRL membership in this licensed group in the club approximates 75% to 85%, much higher than a few years ago. If one cares to picture a club of average composition, it has 7 unlicensed members, 22 or 23 licensed, 3 or 4 Novices and one Technician licensee, according to the reports sent us by club secretaries. Two-thirds of all the stations of club members can use either 'phone or c.w. at will. About 38% of the clubs reporting were noted to have code training programs. There were some 260 calls for ARRL Training Aids from 128 different affiliated clubs during 1952. This represents a good extension by clubs of ARRL training and entertainment features to their membership. The Quizzes provided by ARRL have more than ever become an item in demand by affiliated club groups.

The last annual report of the Communications Manager concludes, "*only by a strong League through participation* can amateurs maintain their reputation for doing things in civil defense. A high general interest in over-all programs must be aroused and maintained and supported by all, if we are to achieve high loyalty and all-essential

unity. With the rise in numbers of other services under FCC, it is a greater challenge than ever to maintain and better our past tradition as practical communicators. The Communications Department objectives set down in the first paragraph of our new department Rules and Regulations continue the ARRL guarantee to do all we can along this line."

RTTY Freqs. In Operating News, May *QST*, it was proposed that to further successful operation by c.w. and RTTY operators and minimize QRM for both, there be a gentlemen's agreement in the use of preferred *calling and working* frequencies in each band. The spot 3620 kc. was easily the favored 80-meter frequency, and got early adoption. We're still counting the post cards requested from RTTY members and c.w. netters and others with your "for or against" designation of a frequency per band (21,210, 14,140, 14,125, 7070, 7090 or 7140 kc. suggested) in other bands, giving your reasons.

Please keep them coming as you note fall operations. Registration (and annual reregistration) of net frequencies, RTTY or other, is one step to help get one's frequency known to others. It is a customary courtesy in amateur work to consult previous registrations when trying to select frequencies. In the teletype field activity continues excellent on 3620. An August meeting of the So. Calif. RTS resulted in concurrence with the ARTS on backing 7140 kc. for "the" *calling and working* RTTY channel for that band. *Remember*, just as it makes for better c.w. contacts always to listen and avoid QRM spots — and in one's own section to make maximum use of the usual section c.w. net frequency — it likewise minimizes QRM for RTTY operators to stick close to frequencies where others are found.

Seasonal Activities. The advance dates of these are all given in the box entitled "Activities Calendar." All suggestions for the "SS" were recently reviewed in staff conference. The preliminary SS announcement with a note of interest to WNs appears elsewhere in this issue. It may be noted that the Ten-Meter WAS Contest which dropped sharply in entries last year will not be held this season. The committee noted that propagation conditions were bound to be unfavorable, also felt that the usual contest support from those 'phone operators, formerly restricted as Class B operators to certain bands, cannot be now counted on. WAS submissions come in greater numbers from work on 40, 80, and 20 meters these days.

For October? We suggest to one and all: Get registered in the AREC and find a way to take part in the Simulated Emergency Test!

— F. E. H.

JULY CD QSO PARTIES

ARRL appointees turned out in droves for both the 'phone and c.w. July CD Parties, giving us two of the liveliest summer parties on record. W4KFC celebrated participation in his *fiftieth* c.w. CD Party (and ORS Party, prewar) by racking up the top total of 111,720 points, 392 QSOs, 56 sections. Nosed out by a cat whisker, W8NBK was right behind with the same number of sections, only *two* less stations worked, and 111,160 points. The third spot went to W4SHJ, the only other entrant to pass the 300-contact mark. Activity in the 'phone portion continued brisk with more and more brasspounders taking mikes in hand to bolster the ranks of the regulars. Biggest total was that of W4NTZ, with 124 QSOs in 31 sections and 19,220 points. Two other appointees who consistently find the CD get-togethers to their liking, W8ZJM and W8NOH, took second and third. High claimed scores:

C.W.

W4KFC	111,720–392–56	W1FTX	38,000–146–50
W8NBK	111,160–390–56	W1LHE	37,105–175–41
W4SHJ	83,700–303–54	W3KUN	35,280–189–36
W4NH	74,870–294–51	W6HFK	35,240– 94–40
W1WPO	63,250–246–50	W4REZ	34,830–156–43
W1RY	62,750–251–50	W4LK	31,800–159–40
W1AW[1]	62,140–232–52	W4JUJ	31,785–156–39
W3LEZ	61,250–245–49	W2AQT	31,510–137–46
W5RID	58,575–210–55	W1NDB/1	31,500–175–35
W9OKI	55,380–213–52	W8ZAU	30,450–138–42
W2ZVW	54,520–232–47	W3PRT	30,210–153–38
W4YIP	54,325–198–53	W9OMC	30,130–126–46
W1ODW	53,775–239–45	WØVBQ	29,250–125–45
W4TAV	52,785–207–51	W7MLL	29,184– 82–38
W3NOE	51,450–245–42	W5AQE	28,560–113–48
W3EEB	49,350–210–47	W8NOH	28,350–130–42
W1CRW	48,825–217–45	W8DAE	27,680–166–32
W4SNH	48,600–211–45	W2CWK	27,550–139–38
W1JYH/1	47,380–200–46	WØSWM	27,500–106–50
W4VHH	45,540–202–44	W4OGG	27,300–125–42
W3VES/1	43,665–206–41	W8TZO	26,410–132–38
W9NH	42,480–171–48	W7GHT	26,106– 73–38

'PHONE

W4NTZ	19,220–124–31	W4FV	8500– 53–25
W8ZJM	13,350– 83–30	W3VE8/1	8050– 53–23
W8NOH	12,420– 87–27	W3EAN	6670– 54–23
W2ZVW	12,000– 80–25	W2ZQ[2]	6510– 62–21
W1AW[1]	11,520– 80–24	W1JYH/1	6300– 30–20
W1MX[3]	10,790– 79–26	W4SHJ	5880– 49–21
W4KFC	10,125– 68–27	W1SFE	5565– 53–21
W4LK	9960– 83–24	W8FUM	5565– 53–21
W9KDV	8580– 66–26	W1PZ	4725– 45–21

[1] W1WPR, opr. [2] W1UJX and W2CQS, oprs. [3] W2NDO, opr.

A June "gathering of the clan" comprising the Deep Sea Dragnet as taken by W1QQY. This scene of festivities was the home of W1PU, NCS, originator and manager of the net. Among the many YLs present were W1s ULF RLQ and SCS, who handled much Worcester tornado traffic.

In order to avoid numerous conflicts with other activities, we have scheduled the Simulated Emergency Test a little earlier this year — October 3rd and 4th. However, when you come to think about it, scheduling the test at all is really all wrong. A Simulated Emergency Test is not a Simulated Emergency Test unless it simulates emergency conditions — that is, unless it happens any old time at all, maybe even during the day when everybody is at work, away from home, or otherwise not normally in or near their shacks. Very few emergencies give us advance notice.

In this year's SET Bulletin, you ECs and SECs will note another paragraph devoted to the proposal for an annual TEA (Test Emergency Alert). The response to the proposal last year was very small (nine, to be exact), but all were in favor of it. It takes a more enthusiastic reception than that to beget implementation, fellows. Maybe this year a response card will be included in the Bulletin. Our own feeling about the TEA is that it would be very valuable as a test of our own efficiency, that it would indicate to us just how ready we really are, but that it should be carried out, initially at least, without any fanfare or publicity — until we know whether or not it is going to be a popular and well-attended activity.

Our tentative thinking is that the Test Emergency Alert would be a complete surprise test of all AREC facilities on a nationwide basis. It would be announced from W1AW (and from perhaps two other high-powered stations, one in the midwest and another in the far west) to take effect immediately on receipt of the alert. It might be on a holiday, during the day or in the middle of the night, in the middle of some other big activity or just any time at all. ECs, on getting the word, would alert their AREC organizations and put them through some kind of a drill, then dispatch a message to headquarters giving the time the alert was received, how it was received, how soon after that the local AREC organization was in action, how many participated, etc. *QST* or bulletin mention would be made of the first ten or so ECs to get their organizations active; thus it would be imperative that no advance information on the alert be available to anybody but the alerting stations.

We're open to other suggestions, of course. Would this take the place of or be additional to the SET? Should it be regional rather than nationwide? Should the announcement precede or follow a regular W1AW Bulletin, or be entirely separate? Should we avoid calling it in the middle of some other activity, or occasionally deliberately do so? Would it be a real test of our preparedness? These and many others are questions still to be answered before any specific action can be taken. Let us have your comments.

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On June 8th a flash flood at Sioux City, Iowa, caused millions of dollars of damage and rendered hundreds of people homeless. WØFZO, en route to Le Mars, Iowa, noticed the rising waters and hastened back to Sioux City. In the city, WØGDE, who was busy performing physical rescue work, called for help by radio and was answered by WØGWM in South Sioux City, Nebraska, who dispatched police aid. WØGDE was given police authority to dispatch boats where they were needed. WØHUH set up a transmitter at the police station and maintained contact with WØGDE at the edge of the flooded area. Later on, a control station, WØFZO, was set up at Red Cross headquarters by WØCXN, WØAZR and WØFZO from equipment supplied by a local radio store. A BC-654 was installed at East High School, a strategic point where commercial power was off. The call WØERG was used. Another rig was set up at Leeds High School, and WØNJQ from Brookings, South Dakota, drove down to help out. The operation continued for some 92 hours without let-up, traffic being handled mostly for the Red Cross, and WØGDE performed many fine rescue operations with his mobile rig. Coöperation was also effected with the police, Highway Patrol, broadcast and TV stations. The Sioux City Air Force Base was without communication into the city, and KØFBL was put into operation there. A unit was also installed in the City Hall, and the Mayor transmitted a message over the mike. The call WØHUH was used at City Hall. On Friday noon, June 12th, the operation was halted.

Says WØFZO, to whom we are indebted for the above information: "Amateur radio was the instrument that awoke the officials of Sioux City; we were the only communication between the relief centers, the police, the rescue squads and the headquarters. Our boys responded with a cooperative attitude that was most reassuring. Many had no sleep for hours and hours. This time we had a job — and did it."

Those participating not already mentioned: WØs BGB DQI FNF FSX FVO GXH GXI HFT LNI MBW MGU OSO POY VJF WFB YMH YNW and W7LER/Ø.

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Too late to make last month's account of the Sabine River flood is the information that some good work was also done by the boys in Lake Charles, as reported by W5BSR. Service was performed for the Weather Bureau and the Lake Charles Air Force Base, the latter being without communication. W5TUR, W5IHR and W5BSR were awarded certificates of appreciation from the U. S. Weather Bureau, the first ever issued. W5CCD also was of invaluable aid in the operation, operating for three days with little or no sleep. Traffic was handled in considerable quantities for the Air Force, National Guard, Naval Reserve, civil defense and other local agencies, as well as many individual messages. W5BSR further states that the operation was the finest job of voluntary frequency clearing that he has seen in many emergency situations.

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On May 22nd through May 24th, the DuPage County (Ill.) Civil Emergency Net established a station at the Boy Scout Camp-O-Ral in Warrenville, Illinois. Ten amateurs set up W9VFB/9 at the camp and manned it for 14 hours on May 23rd and three hours on May 24th. Seventeen other amateurs in the county and surrounding area maintained contact with the station (which operated entirely on emergency power) during this period. Among the many messages handled were included two to obtain transportation home for sick scouts and two others requesting medicine. Several messages for more blankets helped chilly scouts prepare belatedly for the unexpected cold of Friday night. This information comes from W9VFB, who reports the following other operators in the field for this activity: W9s FYT HXE IYL JYI LMM NNE OKQ RMH ZAB.

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July SEC reports numbered 12, representing 2695 AREC members. This compares with 16 reports representing 2845 members last July. None of the twelve was a newcomer to our statistical files. Six ECs have made a perfect reporting record so far this year: So. N. J., Nevada, Vermont, W. N. Y., E. Fla. and Wis. In July of last year there were nine perfect records. So we're still running behind par, fellows.

TRAFFIC TOPICS

There will be work for a lot of you traffic men during the Simulated Emergency Test, October 3rd–4th. The SET is not like it used to be, when every participant dispatched a message to headquarters. Now the participants dispatch their messages to the local EC, who in turn dispatches a summarizing message to headquarters. Even so, a pretty good batch of traffic is flowing, both to ARRL Headquarters and to Red Cross Headquarters during the test. Our organized traffic facilities should be able to handle it in stride.

Civil Defense enters the picture this year, too, to perhaps an even greater extent than heretofore. In short, this is a prying off of the lid of the active traffic season, and the SET gives a needed initial spurt to the fall activity calendar, which is a heavy one. The traffic flowing will be important, because it will be destined mostly to large national organizations wh will be impressed or fail to be impressed, depending on the efficiency, dispatch and accuracy with which the traffic is handled. Much publicity will be attendant, so let's do a whale of a job!

Specifically, what should we organized traffic men do to assist in handling the SET traffic on October 3rd-4th? Here are a few suggestions:

(1) Monitor the National Calling and Emergency Frequencies (see box). It is expected that W3PZA, W9DUA

and W6CXO will be on hand, as usual, to take Red Cross traffic. W1AW and other Connecticut stations will be standing by either on the W1AW frequencies or the NCE frequencies to receive traffic for ARRL. It is hoped that the aid of several Washington stations can be enlisted to assist in handling any civil defense traffic, although at this writing it has not been determined if this will be handled at the national or FCDA regional level.

(2) Conduct Saturday and Sunday special sessions of NTS section, regional and area nets. The traffic is usually heaviest on Sunday and continues through Monday and Tuesday.

(3) If you are in a net in which one of the FCDA regional headquarters is located, be alert to handle traffic destined to that regional headquarters. They are located in Boston, Philadelphia, Atlanta, Dallas, Chicago, Denver and San Francisco.

The SET is whatever we make it. It is a traffic as much as an emergency activity. We need your help this year as in other years because we cannot afford to go backward, only forward, in our progress toward more complete and more efficient organization in the service aspects of amateur radio.

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TCPN reports a traffic total of 2207 in June, with 38 stations reporting. In July, 64 stations reported a traffic total of 1787.

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National Traffic System. W7NH has been appointed the new manager of the Pacific Area Net. With her appointment, which, by the way, makes our area net managers two-thirds female, and the acceptance of WØKHQ to a place on the Pacific Area Staff, this new experiment in integrated traffic organization is launched. The members of the Pacific Area staff are W6JZ (temp. Chairman), W6IPW (RN6 Mgr.), W7PKX (RN7 Mgr.), W7NH (PAN Mgr.) and WØKHQ (at large). W6JZ has also agreed to act as Asst. TCC Mgr. for the Pacific Area temporarily. This leaves two vacancies on the staff for members at large, and these will be filled upon recommendation of the newly-activated PAS (Pacific Area Staff). The PAS meets every Thursday on 7170 kc. (may change to a 3.5-Mc. frequency this fall) to discuss NTS matters in the Pacific Area.

The Transcontinental Corps (TCC) of NTS is now conducting informal sessions on 7170 kc. starting at 2130 EST nightly. This is not a net in the strict sense of the word; it is simply a place for *clearing inter-area traffic only.* Since the TCC is so short-handed, we have asked members to monitor this frequency as and if convenient, in addition to their regular TCC duties, to help out whenever they can if someone gets stuck with traffic going from his area to theirs. This is not a place to come if you have traffic for your own area. The area, regional or section net is the place for that. Even for traffic out of your area, it is much preferable to report it into your area net and clear it to TCC representatives there, if there are any. We tell you about the TCC common meeting frequency only to suggest that if you get stuck with traffic going out of your area, try a "CQ TCC" on 7170 kc. But we don't want it to become a general free-for-all.

July reports:

Net	Sessions	Traffic	High	Averages	Most Consistent
EAN	23	530	40	23.0	1RN, TRN
PAN	23	648	76	28.1	RN7
1RN	19*	144	15	7.6	West Mass.
2RN	23	132	20	5.7	
3RN	42	174	13	4.0	East Pa.
4RN	21	181	19	8.6	Va., S. C.
RN6	47	471	24	10.0	BAN
RN7	54	420	37	7.8	Washington
8RN	13	35	12	2.7	Ohio
9RN	26	967	94	37.0	Ill., Ind.
TEN	46	1035	64	22.5	Ia., Kans., Mo., Minn.
TRN	23	5	5	——	Ontario
Minn. Phone	50	167	61	3.3	
QKS (Kans.)	14	92	11	6.6	
Total	424	5001	94	37	
Record	424	5001	197	51	

* Out of 23 sessions held, others not reported.

An earlier deadline for *QST* copy this month caused a couple of reports to be left out. You boys and gals ought to make an effort to stop getting in just under the wire each month. It's hard on you and on me too. Usually we can sneak in a late report, but once in a while the editor puts on the clamps, and the late reporters have had it. So don't depend on your late report getting in.

Our 1RN was conducted simultaneously with section nets during August and September, with liaison stations running back and forth. If this practice proves to be successful, it may become permanent.

W2NAI reported 2RN for K2BG, who has been ill. Marge says the report is not complete.

An experiment similar to that being tried by 1RN is being tried by 3RN. Section nets will start at 1930, sending representatives at 3RN at 1945 to take traffic and bring back traffic from 3RN. The second 3RN session will not be held.

RN7 traffic is picking up, with W7CZX doing an excellent job as assistant net manager. W7PKX's report shows no representation from Oregon (tch! tch!), Alberta or Saskatchewan sections.

Certificates for 9RN have been earned by and issued to W9s POL RTP RBX and W4PXX.

No Manitoba representation on TEN.

TRN is at a low ebb, and the gang is giving consideration to the proposal to split it among 8RN, 2RN and 1RN.

DX CENTURY CLUB AWARDS

HONOR ROLL

W1FH.....252	W6ENV....243	W3JTC.....238
W8HGW....250	W2BXA....240	W4BPD.....238
WØYXO....246	W3GHD....240	W3KT.....237
W6VFR....246	W6AM.....240	W2AGW.....235
G2PL.....246	W6SN.....239	W3CPV.....235
W3BES.....245	G6ZO.....239	PAØUN.....235

RADIOTELEPHONE

PY2CK.....228	W1NWO....208	W8HGW.....204
W1FH.....224	Z88BW.....207	W9RBI.....200
VQ4ERR....220	W1JCX.....206	SM5KP.....200
XE1AC.....215		W1MCW.....199

From July 15, to August 15, 1953, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

W1AZY.....141	W8ELL.....104	DL7CW.....100
W4HQN.....110	F9DW.....104	EI3S.....100
DL6IC.....109	ZS1BM.....103	G3VW.....100
W9JIP.....105	TF3AR.....101	I1KZ.....100
KP4JE.....105	W8NGO....100	SM5ARL.....100
ZK2AA.....105	W9TKV.....100	VK3RJ.....100

RADIOTELEPHONE

W3UIP.....105	HK4FV.....103	W9JUV.....100
KT1WX.....105	W1RFE.....101	W8NGO.....100
CR6BX.....103		I1AOF.....100

ENDORSEMENTS

W5MIS.....231	W7GBW....161	W5DML.....130
W6CUQ.....220	W7HXG....160	W5DMR.....129
FA8IH.....214	W4JXM....157	W3LXE.....127
W6TI.....210	SM5WF....156	W5OLG.....127
SM5KP.....210	PAØVB.....154	W3DYU.....120
KH6CD.....190	PY2AJ.....154	EA3CY.....120
W6NTR.....181	ZL3GQ.....150	G3EMD.....120
W2RGV.....171	W6MEL.....141	SM5FA.....119
W1DQH.....170	W6VDG....141	OZ7SN.....118
W7ENW.....170	G6QX.....139	F8VK.....111
W8MPW.....170	HB9MQ....139	W3AXT.....110
W9GRV.....170	W6ID.....131	W6DBT.....110
G3BKF.....170		OZ7KV.....110

RADIOTELEPHONE

GM3DHD...190	I1SM.....170	SM5WF.....130
W8GZ.....170	W4DCR....146	CN8MM.....120
	W2RGV....144	

Section Emergency Coördinators of the Amateur Radio Emergency Corps

The Section Emergency Coördinator is appointed by the SCM to take charge of the promotion of the Amateur Radio Emergency Corps organization throughout the Section. He acts as the SCM's executive in the furthering of provisions for emergency amateur radio communications in every community likely to suffer in case of a communications emergency. One of the duties of the SEC is to recommend the appointment of Emergency Coördinators for the various communities in his Section. Does *your* town have an EC? If not, recommend the name of a likely prospect to the SEC. The SEC invites your questions concerning the status of the AREC in your Section.

ATLANTIC DIVISION				
Eastern Pennsylvania	W3IGW	Howard J. Trout	1100 Morris Ave.	Pottstown
Maryland-Delaware-D.C.	W3PRL	John W. Gore	3707 Woodbine Ave.	Baltimore 7, Md.
Southern New Jersey	K2BG	Herbert C. Brooks	800 Lincoln Ave.	Palmyra
Western New York	W2UTH/FRL	Henry A. Blodgett	38 Duffern Dr.	Rochester 16
Western Pennsylvania	W3CA	Kendall Speer, jr.		Lowber
CENTRAL DIVISION				
Illinois	W9HOA	A. B. Brand	1211 Harlem Blvd.	Rockford
Indiana	W9LZI	J. Herman Barnett, jr.	20 Meridian Pl.	Indianapolis 5
Wisconsin	W9OVO	Clayton Cardy		Sawyer
DAKOTA DIVISION				
North Dakota	WØRRW	E. G. Anderson	1413 11th St. N.	Fargo
South Dakota	WØGCP	Wilbur Simantel	113 E. 10 St.	Mitchell
Minnesota	WØBOL	Robert A. Prehm	1130 Delaware Ave.	St. Paul 7
DELTA DIVISION				
Arkansas	W5MRD	Omer Sanders	Box 194	Danville
Louisiana	W5IUG	E. B. Hazlewood	9990 New Hammond Hwy.	Baton Rouge
Mississippi	W5YOZ	Jack M. Martin	P. O. Box 990	Gulfport
Tennessee	W4NJE	F. M. Bruington	Box 246	Lewisburg
GREAT LAKES DIVISION				
Kentucky	W4MGT	Henry C. Hall	334 Grosvenor Ave.	Lexington
Michigan	W8GJH	Francis E. Gary	620 Thayer St.	Flint 3
Ohio	W8UTB	Dana E. Cartwright, sr.	2979 Observatory Rd.	Cincinnati 8
HUDSON DIVISION				
Eastern New York	W2RTE	Theodore L. Buley	Vassar Rd.	Poughkeepsie
N.Y.C. & Long Island	W2ZAI	James R. Waite	9 Landau St.	Elmont, L. I
Northern New Jersey	W2NKD	Thomas J. Ryan, jr.	1082 Anna St.	Elizabeth 4
MIDWEST DIVISION				
Iowa	WØVRA	Jack P. Henry	1215 Vine St.	Waterloo
Kansas	WØPAH	W. G. Schrenk	1528 Pierre St.	Manhattan
Missouri	WØVRF	O. H. Huggins	3605 E. 72nd St.	Kansas City
Nebraska	WØJDJ	Francis B. Johnson	820 S. 44th St.	Lincoln 8
NEW ENGLAND DIVISION				
Connecticut	W1LKF	Peter R. de Bruyn	163 S. Marshall St.	Hartford 5
Maine	W1BYK	Donald R. Dean	36 James St.	Auburn
Eastern Massachusetts	W1BL	Raymond E. Boardman	53 Thurston Rd.	Newton Upper Falls 64
Western Massachusetts	W1KUE	Thomas F. Barrett	759 White St.	Springfield
New Hampshire	W1BXU	William E. Goldthwaite	24 Franklin St.	Concord
Rhode Island	W1MIJ	Carl M. Getter	185 Early St.	Providence
Vermont	W1NLO	Burtis W. Dean	P.O. Box 81	Burlington
NORTHWESTERN DIVISION				
Alaska	KL7PE	John H. Huber	Box 2097	Fairbanks
Idaho	W7IWU	Alan K. Rose	2105 Irene St.	Boise
Montana	W7KUH	Walter R. Marten	720 9th Ave., S.W.	Great Falls
Oregon	W7HDN	E. C. Wiedmaier	11004 N. E. Shaver St.	Portland 13
Washington	W7BTV	Eugene H. Dodge	663 N. Skyline Dr.	Tacoma 6
PACIFIC DIVISION				
Hawaii	KH6AS	John Keawe	714 Ocean View Dr.	Honolulu
Nevada	W7HJ	Frank A. Wilson	433 Birch St.	Boulder City
Santa Clara Valley	W6AEV	George W. Harper	101 Plymouth Ave.	San Carlos
East Bay	W6WGM	Jay Amaro	199 Harrier St.	Vallejo
San Francisco	W6NL	Samuel C. Van Llew	215 Knowles Ave.	Daly City
Sacramento Valley	W6AVZ	Clifford van Ciel	Box 547	Greenville
San Joaquin Valley	W6KRO	William H. Clark, jr.	541 Hunter Ave.	Modesto
ROANOKE DIVISION				
North Carolina	W4ZG	Roy C. Corderman	792 Oaklawn Ave.	Winston-Salem
South Carolina	W4DX	Ben L. Team	1306 Fair St.	Camden
Virginia	W4NAD	William E. Sampson, jr.	4801 Stuart Ave.	Richmond
West Virginia	W8VPR	S. A. Whitt	500 Kirk St.	Princeton
ROCKY MOUNTAIN DIVISION				
Colorado	WØAEE	Henry M. Adams	2690 Oneida St.	Denver 7
Utah	W7JOE	John Tempest, jr.	1599 Orchard Dr.	Salt Lake City
Wyoming	W7LKQ	Duane L. Williams	1022 S. Cherry, Apt. 4	Casper
SOUTHEASTERN DIVISION				
Alabama	W4ISD	P. G. Persson	123 Margaret St.	Mobile
Eastern Florida	W4IM	G. B. Angle	Rt. 2, Box 776	Fort Lauderdale
Western Florida	W4PLE	Landon L. Hoyt	S.S.B., O.T.D., 3200th P.T.W.	Eglin A.F.B.
Georgia	W4EJC	J. Herb Axsom	202 N. Semmes St.	East Point
West Indies (Cuba-P.R.-V.I.)	KP4HZ	Jorge N. Toledo	610 Union St.	Miramar, Santurce, P.R.
Canal Zone	KZ5RM	Roger M. Howe	Box 462	Balboa Heights
SOUTHWESTERN DIVISION				
Los Angeles	W6QJW	Howard F. Shepherd, jr.	127 So. Citrus Ave.	Los Angeles 36
Arizona	W7OIF	Cameron A. Allen	1020 E. Maryland	Phoenix
San Diego	W6VFT	Ben S. Hamilton	4762 68th St.	San Diego
Santa Barbara				
WEST GULF DIVISION				
Northern Texas	W5QHI	Frank J. Haahn	8719 Redondo	Dallas 18
Oklahoma	W5AGM	Claude E. Gardner	Route 6, Box 120	Oklahoma City
Southern Texas	W5GLS	George N. Sharp	3541 Federal St.	Pasadena
New Mexico	W5MYI	John C. Harvey	P.O. Box 1002	Santa Fe
CANADIAN DIVISION				
Maritime	VE1PQ	L. J. Fader	125 Henry St.	Halifax, N. S.
Ontario	VE3KM	T. W. Clemence	2278 King St., East	Hamilton
Quebec	VE2BR	A. George Brewer	4334 Montrose Ave.	Westmount, Montreal
Alberta	VE6MJ	Sydney T. Jones	10706-57th Ave.	Edmonton
British Columbia	VE7PO	Clarence R. D. Ferris	142 Linden Ave.	Victoria
Yukon				
Manitoba				
Saskatchewan	VE5BZ	William Roy McDonagh	Box 54	Zealandia

W1AW OPERATING SCHEDULE

(Effective September 27, 1953)
(All times given are Eastern Standard Time)

W1AW will return to its fall-winter operating schedule with the return to Standard Time. General operation has been expanded to cover the 21-Mc. 'phone band and the 7-Mc. 'phone band as well as continuation of general operation in the 21-Mc. c.w. band. Novice periods are being continued and expanded to include two late-hour periods on 7 Mc. to accommodate Novice operators in far western areas. Lithographed master schedules showing complete W1AW operation in EST, CST or PST will be sent to anyone on request.

Operating-Visiting hours:
Monday through Friday: 1500–0300 (following day).
Saturday: 1900–0230 (Sunday).
Sunday: 1500–2230.

Exceptions: W1AW will be closed from 0300, Nov. 26th, to 1500, Nov. 27th, and similar times Dec. 25th and 26th, Thanksgiving and Christmas holidays.

General Operation: Use the chart below for determining times during which W1AW engages in general operation on various frequencies, 'phone and c.w. Note that since the schedule is organized in EST, certain morning operating periods may fall in the evening of the previous day in western time zones. W1AW will participate in all official ARRL operating activities, using scheduled general operating periods for this purpose if necessary.

Official ARRL Bulletin Schedule: Bulletins containing latest information on matters of general amateur interest are transmitted on regular schedules:

Frequencies (kc.):
C.w.: 1885, 3555, 7125, 14,100, 21,020, 52,000, 145,600
'Phone: 1885, 3950, 7255, 14,280, 21,350, 52,000, 145,600.
Frequencies may vary slightly from round figures given; they are to assist in finding the W1AW signal, not for exact calibration purposes.

Times:
Sunday through Friday: 2000 by c.w., 2100 by 'phone.
Monday through Saturday: 2330 by 'phone, 2400 by c.w.

NOTE: A *test* daytime run of OBS information, on all c.w. frequencies starting 1500 EST and on 'phone 1600 EST, will be made October 12th to 22nd inclusive. General operating (per table) will be deferred these dates until the end of the Bulletin. The purpose of this test is to determine whether amateurs prefer the time spent to be used for Bulletins or for personal contacts with W1AW.

Code Proficiency Program: Practice transmissions are made on the above-listed c.w. frequencies, starting at 2130 daily. Speeds are 15, 20, 25, 30 and 35 w.p.m. on Monday, Wednesday and Friday, and 5, 7½, 10 and 13 w.p.m. on Sunday, Tuesday, Thursday and Saturday. Approximately ten minutes of practice is given at each speed. *Exceptions:* On October 16th and November 16th W1AW will transmit ARRL Code Proficiency Qualifying Runs, and on November 19th there will be a Frequency Measuring Test instead of the regular code practice.

A.R.R.L. ACTIVITIES CALENDAR

Oct. 2nd: CP Qualifying Run — W6OWP
Oct. 3rd-4th: Simulated Emergency Test
Oct. 10th-11th: CD QSO Party (c.w.)
Oct. 16th: CP Qualifying Run — W1AW
Oct. 17th-18th: CD QSO Party ('phone)
Nov. 7th: CP Qualifying Run — W6OWP
Nov. 14th-15th, 21st-22nd: Sweepstakes
Nov. 16th: CP Qualifying Run — W1AW
Dec. 6th: CP Qualifying Run — W6OWP
Dec. 15th: CP Qualifying Run — W1AW
Jan. 8th: CP Qualifying Run — W6OWP
Jan. 9th–10th: V.H.F. Sweepstakes
Jan. 9th-24th: Novice Round-up
Jan. 13th: CP Qualifying Run — W1AW
Jan. 16th-17th: CD QSO Party (c.w.)
Jan. 23rd-24th: CD QSO Party ('phone)

CODE-PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on October 16th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,020, 52,000 and 145,600 kc. The next qualifying run *from W6OWP only* will be transmitted on October 2nd at 2100 PST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of *all* qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EST. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text is reversed during certain of the slow-speed transmissions. To get sending practice, hook up your own key and buzzer and attempt to send with W1AW

Date	Subject of Practice Text from August *QST*
Oct. 1st:	*Low-Noise R.F. Amplifiers* . . . , p. 13
Oct. 5th:	*Negative Feed-back Modulation*, p. 17
Oct. 9th:	*Eighty Watts on Six Bands*, p. 20
Oct. 12th:	*An F.S.K. System* . . . , p. 23
Oct. 15th:	*A Four-Band Miniature 'Phone-C.w. rig*, p. 26
Oct. 19th:	*Is Your Rig R.F.-Tight?*, p. 29
Oct. 21st:	*The "Plain Ground-Plane" Antenna*, p. 36
Oct. 27th:	*A Seafaring Kilowatt*, p. 31
Oct. 29th:	*The Multiband Antenna Coupler*, p. 40

W1AW GENERAL-CONTACT SCHEDULE
(Effective September 27, 1953)

W1AW welcomes calls from *any* amateur station. Starting September 27th, W1AW will listen for calls in accordance with the following time-frequency chart.

EST	*Sunday*	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
0020–0100[1]	.....	.....	3555	7125[2]	3555	7125[2]	3555
0100–0200	.....	.....	3950	7255	3555	7125	3950
0200–0300	.....	.....	7125	3950	7125	3950	7255
1500–1600	.....	.....	14,280	21/28 Mc.[3]	14,100	.....	.....
1600–1700	.....	14,280	21/28 Mc.[3]	14,100	21/28 Mc.[3]	21,350	.....
1700–1800	.....	14,100	14,280	21,020	14,280	14,100	.....
1930–2000	.....	7255	.....	7125	.....	7255	.....
2020–2100[1]	.....	7125	3555	7125[2]	3555[2]	7125	.....
2110–2130[1]	.....	3950	52 Mc.	145.6 Mc.	3950	3950	.....
2230–2330	.....	3555	3950	7125	1885	3555	.....
2340–2400[1]	.....	3950	1885	3950	1885	3950	.....

[1] General-contact period on stated frequency begins immediately following transmission of Official Bulletin which begins at 0000 and 2000 on c.w. and at 2100 and 2330 on 'phone. Starting time is approximate.
[2] W1AW will listen for Novices (on WN-band indicated) before looking over the band for other contacts.
[3] Operation will be conducted on one of the following frequencies: 21,020; 21,350; 28,060; 28,768 kc.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for July traffic:

Call	Orig.	Recd.	Rel.	Del.	Tota
W3CUL	407	2733	1861	872	5873
KG6FAA	425	2702	2525	159	5811
KA7LJ	504	1879	1494	385	4352
W4UBA	52	1027	1201	64	2344
K4WAR	270	787	692	95	1844
KH6AJF	67	808	735	73	1683
W6KYV	127	715	317	398	1557
W4PL	16	764	586	170	1536
W9CFI	14	633	589	44	1280
W7BA	32	594	543	48	1217
W3WIQ	16	469	435	27	947
W9NZZ	324	304	4	295	927
W9JUJ	13	439	375	35	862
W9KHQ	12	423	408	12	855
W3USA	26	385	344	41	796
W7PEF	355	217	0	217	789
W9BDR	3	372	361	10	746
K6FAL	230	218	194	39	681
W4FPC	11	21	610	21	663
W7PGY	17	303	290	13	623
K2WAO	11	292	253	39	595
W8ZGT	76	274	170	35	555
W5TFB	16	264	260	4	544
W7KOY	104	182	28	210	524
Late Reports:					
KH6AJF (June)	71	467	476	62	1076
KH6AJF (May)	34	340	324	64	762
W4TAV (June)	11	337	261	51	660
K4WAR (June)	88	245	205	40	578
W8YIN (June)	45	261	248	13	567

BPL for 100 or more *originations-plus-deliveries:*

W4WHC	338	VO6U	145
W7PMD	309	W0SWB	141
W0KFF	222	K0FAM	133
W3WV/3	173	VE1FQ	128
W2IFP/1	157	W2OMG	124
W6YDK	154	W6MBA	118
W9LHB/9	152	W8JAR	116
W6LYG	146	W9OKI	114
W4DRD	112		
W4TFP	107		
W9SWM	103		
W2JOA	100		

Late Reports:

K6FAL (Jan.)	144
W9OKI (May)	133
K6FAL (Feb.)	124

The BPL is open to all operators who report to their SCM a message total of 500 or more or 100 or more originations-plus-deliveries for any calendar month.

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Wyoming	Wallace J. Ritter, W7PKX	June 15, 1953
Hawaii	James E. Keefer, KH6KS	June 15, 1953
San Joaquin Valley	Edward L. Bewley, W6GIW	June 15, 1953
Eastern Florida	John W. Hollister, W4FWZ	Aug. 14, 1953
San Francisco	Walter A. Buckley, W6GGC	Aug. 14, 1953
Vermont	Robert L. Scott, W1RNA	Oct. 15, 1953

In the New York City and Long Island Section of the Hudson Division, Mr. Carleton L. Coleman, W2YBT, and Mr. Joseph J. Kosina, W2LGK, were nominated. Mr. Coleman received 276 votes and Mr. Kosina received 204 votes. Mr. Coleman's term of office began July 31, 1953.

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Sections. This notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five or more ARRL full members of the Section concerned, in good standing, are *required* on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested: (Signers will please add city and street address to facilitate checking membership.)

Communications Manager, ARRL [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the.....
.....ARRL Section of the.....
Division, hereby nominate.....
as candidate for Section Communications Manager for this Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

— *F. E. Handy, Communications Manager*

Section	Closing Date	SCM	Present Term Ends
Yukon *	Oct. 15, 1953	W. R. Williamson	Mar. 17, 1949
West Indies	Oct. 15, 1953	William Werner	Aug. 15, 1952
Maritime *	Oct. 15, 1953	Arthur M. Crowell	Oct. 16, 1952
Western Florida	Oct. 15, 1953	Edward J. Collins	July 29, 1953
Ohio	Oct. 15, 1953	John E. Siringer	Dec. 14, 1953
Eastern New York	Oct. 15, 1953	Stephen J. Neason	Dec. 14, 1953
Illinois	Oct. 15, 1953	H. F. Lund	Dec. 14, 1953
North Dakota	Oct. 15, 1953	Everett E. Hill	Resigned
Northern Texas	Oct. 15, 1953	William J. Gentry	Resigned
San Diego	Oct. 15, 1953	Edgar M. Cameron, jr.	Resigned
Alaska	Nov. 13, 1953	Glen Jefferson	Jan. 15, 1954
Oklahoma	Dec. 15, 1953	J. M. Langford	Feb. 15, 1954
Utah	Dec. 15, 1953	Floyd L. Hinshaw	Feb. 18, 1954
Georgia	Jan. 15, 1954	James P. Born, jr.	Mar. 8, 1954
Washington	Jan. 15, 1954	Laurence Sebring	Mar. 10, 1954

* In Canadian Sections nominating petitions for Section Managers must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates.

NATIONAL CALLING AND EMERGENCY FREQUENCIES

C.W.	*'PHONE*
3550 kc. 14,050 kc.	3875 kc. 14,225 kc.
7100 kc. 21,050 kc.	7250 kc. 21,400 kc.
28,100 kc.	29,640 kc.

During periods of communications emergency these channels will be monitored for emergency traffic: At other times, use the frequencies as general calling frequencies. Emergency traffic has precedence. After contact has been made the frequency should be *vacated immediately.*

The following are the National Calling and Emergency Frequencies for Canada: *c.w.* — 3535, 7050, 14,060; *'phone* — 3815, 14,160, 28,250 kc.

NATIONAL RTTY CALLING AND WORKING FREQUENCY

3620 kc.

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA — SCM, W. H. Wiand, W3BIP — SEC: IGW. RM: AXA. PAM: PYF. E. Pa. Nets: 3610, 3850 kc. South Philadelphia ARC meets at the Childs School, 17th and Tasken, every 1st and 2nd Tue. of each month, as reported by the secretary, QLZ. The Pottstown ARA now is an ARRL affiliated club with FFX, pres.; EXM, vice-pres.; IGF, secy.; ARK, treas. The Phil-Mont Mobile RC gained several new members with 8TA, ADF, VOC, UVL being the most recent. Each are active on all bands as well as mobile. QQH is chairman in charge of communications for the Sports Car Race to be held in the vicinity of Fairmont Park, Philadelphia, Oct. 10th and 11th, while QV, NIP, RQZ, QQH, VVS, HYU, AAG, D8G, IVD, KVG, GPX, SMP, and W2SEW turned out to provide communications for the annual Delaware River Speedboat Marathon. Six members of the York ARC are mobile on 2 meters, says UQJ, who has just completed a 420-Mc. converter using 6J4 *r.f.*, 955 osc./mix., four 6BA6s in a 12-Mc. *i.f.* strip to work into an NC-173. RSC reports MAG is back on the air with 300 watts and NPE is building a new mobile rig. A8W heads our OOs for accuracy in the May F.M.T., with an average error of only three parts in a million. VDE ran second with sixty-eight parts per million as his average. PYF would like to see 3850 kc. the meeting place for all E. Pa. LOs wanting a good ragchew with their fellow officials. Likewise, 3610 kc. will add a few c.w. contacts to your pleasure on LONITE, July 25th, through the hard work of GH, VV, CPL, ETB, EUD, HPK, IGW, KFQ, MFD, MLY, PUZ, QOR, TCC, UVI, TOD, WGD, FNF, and SJI, amateur mobiles were the *primary* means of communication for the annual BYRNFAN TYDDYN Road Races, course 3½ miles at Harvey's Lake, Pa. Following the activities the gang enjoyed a feed at the summer home of Mrs. Stenger, widow of W3ZS. The Bill (1021) proposing amateur call letters on auto tags in Pennsylvania was defeated. We have until 1955 to shape this issue into a new Bill that will spell victory is we continue to talk it up. This office would welcome more club news. Traffic: W3CUL 5873, BIP 106, PYF 102, RSC 48, MAC 42, KAG 37, ONA 36, OZV 34, PVY 34, DUI 31, BFF 26, GES 20, QLZ 20, QOL 20, S8U 18, EAN 13, BES 5, PDJ 4, TEJ 4, UCY 4.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Arthur W. Plummer, W3EQK — SEC: PRL. EC for State of Delaware and Asst SEC: DB. EC for State of Maryland and Asst SEC: PWB. COK hopes to finish his rig while vacationing. 2nd Lt. Harry Osterman is new MARS Director at W3USA, Fort George G. Meade, Md. The Potomac Valley Radio Club held a very nice informal summer meeting July 7th at the home of 4NTZ, Alexandria, Va. EIS and 4KFC operated from a tobacco field at Beltsville, Md., on Field Day in Class B category with rented storage batteries. Did anyone hear CQS July 7th when he operated portable 20 watts with a 474A from Bethany Beach, Del.? On c.w. yet! ONB heard a chance remark on 3RN that GEG and himself would be in a certain town on the same day, so after years of ragchewing on 80 meters they finally met face to face. PRT is at it again after returning from college. AY8 reports this was the best Field Day yet for CARC; he also has a new 75A-3. QZC is counsellor at a camp in Connecticut but failed to include portable gear with his camping equipment. At the MEPN picnic Aug. 7th SKN had lots of help in finding out why his mobile rig would not work! He had charged his battery backward, thus reversing plate supply polarity. He turned things around and now is working FB. Eight Antietam Radio Association members enjoyed an FB hamfest at Gambrill's State Park near Frederick, Md. The Antietam Radio Assn., Hagerstown, Md., is making plans to set up an amateur station at the Red Cross Booth at the Hagerstown Fair. CVE reports that 9UNJ, of Milwaukee, Wis., recently qualified as a member of TCRN. Anyone interested in becoming a member of TCRN, contact CVE. The net operates daily 0515-0615 GMT on 7042 kc. Bert Compton, who is sightless, received his ticket this month and has the call WCH. WN3WCQ and WN3WCS are new Novices. WN3UYP and WN3UWT (the sole XYL member of the Chesapeake Amateur Radio Club) recently dropped the "N" from their calls and obtained General Class tickets. UYP was ready for the changeover with a 10-meter mobile rig installed in his car. NYL gave a talk on "Screen Grid Modulation" at the CARC meeting Aug. 10th. CVE reports TCRN is an emergency as well as traffic net. He keeps in touch with Red Cross and Weather Bureau in Washington, D.C., and is on the alert for any emergency. Paul Rockwell, CDRO for Baltimore County, gave a talk at the CARC meeting July 27th on "Amateur Radio in Baltimore County Civil Defense." Will "Stan" please get in touch again with the SCM regarding OO appointment. Your name and address has been misplaced. GBB made a five-week vacation trip through Yellowstone and California, mobiling on all bands, 10 through 75 meters and on 20-meter 'phone. GCK, who was active on 160 and 75 meters, passed away June 10th. 5GWD/3 has been assigned to MATS at Andrews Air Force Base and is mobiling on 75 meters using 18" hat. FU reports a meeting held in Laurel, Del., July 31st was attended by VUK, DOG, BAK, 8SV, TKL, ULQ, TCQ, DB, STS, MCD, VV, HLI, WDM, UVT, 8BR, PVO, BM, RRF, TRN, TXL, NTB, FU, WN3WDS, WN3VVP, 2LEO/3, 4SR, 6RLV/3, and several would-be hams. TCQ, of Seaford, Del., accepted the office of chairman pro-tem and FU that of secretary. The next meeting will be held Sept. 25th at Dutch Shoppe, Laurel, Del., at 8 P.M. EQK returned to Baltimore on July 27th after a two-week vacation on Cape Breton Island, Nova Scotia, and operated while there as W3EQK/VE1. He kept in touch (20-meter 'phone) with KDD, JNN, and JNM in Baltimore and also worked some 75-meter mobile with 52' piece of wire hooked to end of whip loaded with 20-meter coil in center and QSOed GM2AZN in Scotland with the end of the above wire fastened to a tree branch about 8' above ground. The report was S6. Traffic: (July) W3U8A 796, WV/3 173, PGO 129, COK 92, CQS 70, CVE 61, QCB 50, JE 31, ONB 18, NNX 8, HK8 2, PRT 1. (June) W3COK 82, ONB 17.

SOUTHERN NEW JERSEY — SCM, Lloyd L. Gainey, W2UCV — K2BG, our new SCM, is on the sick list this month, along with ZI. We're looking forward to next month's column, which will be Herb's first. WN2JMD attended the Boy Scout Jamboree in California and ran into quite a few hams there. PAU now is operating 2-meter mobile from a large-size Volkswagen. To say the least, it's cozy. 8VV has been experimenting with skyhooks for his 2-meter antennas. The latest one is a 13-foot balloon. YNJ expects to return from Korea shortly. The Gonset Communicators have been doing excellent service in the Trenton Area. SDO has been working a 25-hour day these last few months, which should account for the inactivity from his shack. TBD, formerly of New York State, has relocated in Collingswood. RFW has an active station on 10 meters. 8AI is using a terrific antenna on 20 meters. The reflector is a wire net 105 feet by 40 feet in back of three stacked arrays and the whole thing rotates. Many thanks to the hams in this section for their fine coöperation during the past two years I have served as SCM. I would like to be the first of many to offer K2BG, our new SCM, my full support. Traffic: K2WAO 595, W2RG 120, ZVW 61, ZI 5.

WESTERN NEW YORK — SCM, Edward Graf, W2SJV — SEC: UTH. RM: RUF. PAM: G8S. NYS meets on 3615 kc. at 7 P.M. and on 3980 kc. at 6 P.M.; NY8S on 3595 kc. at 8 P.M.; NYS C.D. on 3509.5 and 3993 kc. at 9 A.M. Sun. UTH worked Vermont on 2 meters. EMW is looking for a new QTH because of noise. The Second Regional 'Phone Net operates on 3980 kc. Mon. through Sat. at 1500; Net Manager is NAI. There is direct coverage of NY8 and N.J. in liaison with NY8 'phone, Deep Sea Drag, TCPN, and MARS. Asst. Mgr. is NOC; NCSs are BNG, EOM, and K2WAO. UTH visited 9HDV while on vacation and on a return trip stopped to see 8BFQ. ZHU has a second station call of K2AVG for c.d. On June 5th, 6th, and 7th the Herkimer County Boy Scouts held their Jamboree, with KIC furnishing portable amateur communications with traffic to their families and requests for camp supplies through PYC. Also participating were CCA, VYX, AEX, VNZ, and KV. PYC is on 'phone with 812 cathode modulated. QQ vacationed in VE3-Land. K2B8C and AEX are regulars in the local AREC Net. RLW is the proud papa of a daughter. BTB is back on the air after a severe illness. PYD has r.f. to spare. The first time he threw his kw. on 40-meter 'phone on the air it caused all

the telephones in the neighborhood to ring. The RARA family picnic was held at Kern's Grove with plenty of fun, eats, drinks, and prizes. MYN has new NC-120 and Lettine 240. COU was at Camp Drum. 8UPS now is K2DRG. GVJ is in New Jersey for the summer. H8I has been appointed RAWNY treasurer. K2AHH and NAI have been appointed as OBS. NAI is new OPS. Antenna farms are the thing, according to PXB, RXM, and IJR. Everyone is welcome to visit the Antique Amateur Radio Museum at the QTH of ICE. K2ANC received General Class license in January and works all bands, 80 through 10 meters, with a Viking I. QNA lost tower and 6- and 2-meter beams in a recent storm. MA is on s.s.b. The RARA v.h.f. group met at the home of UXP. ZOL is home again after spending several weeks in the hospital. DEX is busy with new QTH, so VIQ is taking C.D. NCS on the c.w. net for a few months. Traffic: (July) W2RUF 316, ZRC 154, ZOL 100, IPC 55, BTB 50, UTH 41, BNC 35, HKA 29, SJV 29, PYC 17, RQF 16, K2DG 12, W2DVE 12, OZR 9, EMW 8, FGL 7, KEL 6. (June) W2PYC 31, EMW 24, ZHU 2.

WESTERN PENNSYLVANIA — SCM, R.M. Heck, W3NCD — RMs: NUG, GEG, UHN. PAM: AER. SEC: CA. I wish to announce the appointment of Kendall Speer, jr., CA, of Lowber, to the office of Western Pennsylvania Section Emergency Coördinator and request the full support of section amateurs in helping him reorganize and build up our AREC. All holders of EC appointments, please send certificates for endorsement if needed and send me reports on the status of your county organization. To amateurs in those counties having no Emergency Corps organization, get together and form a group that is interested. Write me and I'll be glad to send you any information you need and the new SEC and I will aid you in your efforts. All OPS appointees please note: PYF has organized the Pennsylvania 'Phone Net and needs more members from our section. The Net meets Mon. through Fri. at 1900 hours on 3850 kc. I hope you boys will join in and support this activity as much as you are able; also this office would appreciate some reports from the 'phone gang for this column. The SCARC *Kilowatt Harmonics* reports: Field Day this year was a great success, at least in the matter of energy, coöperation, and seeming enjoyment of all participants; v.h.f. is showing up well in the area, with KWH in the V.H.F. Contest, UHM, NRQ, NBP, SDV, and RXT operating; if interested in 75-meter mobile join in the West Dog Net, QYF as Net Control, on 3865 kc. every Sun. at 11:00 A.M. EDST. QN of the RAE, Erie, sends the following notes: Ronnie Barker is anxiously awaiting his WN ticket; PSI is working on 40-meter 'phone with new 600-watt rig; MXM was visited in the hospital by fellow hams WBA, TMK, RIV, LKH, and QPF; NGB is home on leave from Korea; PJD is home from a visit to Europe and is back on the air; TKT, vice-pres. of RAE, is leaving to take up new residence near Cincinnati, Ohio; the RAE meeting place will be in the Firehouse at 23rd and Ash Streets, meetings changed to the 1st and 3rd Thurs. each month. The Call Letter Plate Bill failed passage. Traffic: (July) W3WIQ 947, GEG 132, NRE 115, UHN 51, SIJ 26, KNQ 16, AER 9, LSS 3. (June) W3GEG 310. (May) W3GEG 146.

CENTRAL DIVISION

INDIANA — SCM, Clifford C. McGuyer, W9DGA — ZMP, MGQ, GQD, MUR, GJG, and LZR provided communications for the C.A.P Air Fair at Richmond. NH reports working ZL1WW on 160-meter c.w. UTZ is in Iceland. CWB is building 750-watt p.p. 813 rig. KRJ has a new antenna. HZL is a papa. PUV works 2 meters. QBN was the first YL to operate in the LCARC Field Day. WKN is back on 75 meters. PAS has p.p. 250THS in the final. RWN works at Hammond b.c. station. INU has gone hi-fi. LEF has a new HRO. The LCARC has an SX-71 receiver and Viking II transmitter. Two new officers of the LCARC are PAS, vice-pres., and INU, treas. Thanks to GUX for the above LCARC information. JBQ reports the RFN traffic as 28. WN9TGX visited TARS. SWH reports BKJ, QR, and CLF had their pictures in *GE News*. KDV was high 'phone scorer for the Central Division in the April CD Party. The IRCC picnic had 304 registrations. OGX is a microfilm technician. JFF, MOW, SAR, NTK, NXU, LDL, QBH, K9AAY, WN9JYS, W9DSC, ENS, SLI, VJW, KQG, and RBX attended the 147.3-Mc. picnic at Carmel. The Montgomery ARC of Crawfordsville has affiliated with ARRL. DGA vacationed in Montreal, New England States, and visited ARRL Headquarters. Central Division Director, AND, gave a talk to the Evansville group. UIA and UNT attended the Turkey Run V.H.F. Picnic. IICP gave a TVI talk to the Indianapolis RC. AKP retired from the Navy after 18 years. JIP works DX on 20-meter 'phone. URC has a new HRO. ICY is with the Anderson Police. FYM was high scorer in the Vermont QSO Party from Indiana. TKV moved to Chicago. The IRC Field Day score was 3670. DSC left the Indianapolis Police and is now with WISH. UIA worked VE7DU on 6 meters. OGX won first prize for composite mobile at the IRCC Hamfest at Indianapolis. DKR moved his shack to the garage. ZIB is building a Viking mobile rig and assisting the gang to get on 147.3 Mc. KLR worked New Jersey for state No. 16 on 2 meters. MUR reports Wayne County has six stations on 147.3 Mc. FYM is building new three-element beam for 20 meters. DKR cleared his TVI. PEO is building a kw. IFX will be back from Korea soon. TLR is going mobile. NTA is doing FB as a new PAM. NTA is building twelve-element 2-meter beam. QYQ has Elmac mobile receiver and transmitter. DHJ has new 5-over-5 beam for 2 meters. PPS received his 35-w.p.m. CP award. SWM reports going high power. JUJ vacationed at the lakes in Northern Indiana. New appointments: NTA as PAM, YWE as RM, UQP and STC as ORS, OGX and PPS as OPS, ERB as OBS, LDL and RBX as OES. UMS is chairman of the Evansville TVI committee. UHV is building 220-Mc. transmitter. Traffic: (July) W9NZZ 927, JUJ 862, TT 339, YWE 269, SWM 173, PPS 167, CMT 88, RBX 73, ERB 62, DHJ 54, NTA 48, QYQ 43, JBQ 35, DOK 27, VNV 26, OGX 20, WBA 20, DKR 18, UQP 17, TG 16, WUH 9, ZIB 9, OLX 8, UMS 6, FYM 4, KDV 4, DGA 3, BDP 1, QLW 1. (June) W9LZI 44, WBA 30, GUX 16, DKR 14.

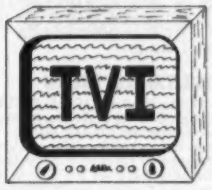
WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OVO. PAM: ESJ. RMs: MQV and UNJ. Nets: BEN meets on 3950 kc. at 6 P.M.; WIN on 3625 kc. at 7 P.M. State mobile and c.d. frequency, 29,620 kc. Congrats to UNJ, who made BPL for the third consecutive month with a total of 529. SAA is remodeling the radio shack. ERW moved to a new QTH and needs some good antenna supports. VOD is on with a Viking. LSK has had to relinquish his OBS schedule because of irregular working hours. XE1BT attended the National Convention at Houston. FAN is working on an 832A tripler to 420 Mc. plus a crystal converter and 420-Mc. beam. DDG has new 24-element 144-Mc. and 30-element 220-Mc. phased arrays. IMQ is moving to Green Bay. The v.h.f. picnic was held Aug. 23rd at the QTH of RXS. AFT has under construction a new 144-Mc. final with VT127As at 900 watts. WN9ZAD, the XYL of AFT, has worked 6 states and 3 call areas on 144 Mc. with 75 watts to sixteen-element beam. LEE is building a crystal diode noise generator. WN9VGL is new at Greenleaf. GFL is building new 144-Mc. rig with an 829B in the final. HDZ now is stationed at Fort Monmouth with the Signal Corps. MQV had a visit from his brother-in-law, 6CIY. Correction: Mobiles of BPR, MGT, ONY, CUW, LVR, NLY, and MDG represented the Milwaukee Radio Amateurs' Club (not MAREC) assisting the military in the set-up for the Armed Forces Day Parade. Appointment renewals: MQV as ORS and EC, FAN as OES, ANM as ORS and OPS. New appointments: MQV and UNJ as RM. The c.w. net (WIN) operation begins the season with MQV at the helm as Net Manager. VKR received his 30-w.p.m. Code Proficiency certificate. A Wisconsin *QCD Standard Operating Procedure and Training Manual* for stations operating in RACES is now being prepared. ZHE is new at Wausau and operates mobile with a Gonset transmitter and converter. Traffic: W9UNJ 529, MQV 186, RTP 121, CXY 69, SAA 36, NLE 20, GMY 15, OVO 8, VYX 8, MUM 7, OOF 7, RQM 6.

DAKOTA DIVISION

SOUTH DAKOTA — SCM, J. W. Sikorski, WØRRN — Asst. SCMs: Earl Shirley, ØYQR, and Martha Shirley, ØZWL. SEC: GCP. PAM: UVL. RM: OLB. Despite generally poor DX conditions, LBS continues working it on 20 meters. He had 12 new countries and 8MV had 11. Director PHR visited North Dakota clubs and vacationed in Canada. The Big Sioux Radio Club, Flandreau, has been assigned the call PBQ. The Club meets monthly in the Presbyterian Church chapel. KØFCR has added another BC-610 and two 51Js. South Dakota hams are sporting their new call letter license plates. GDE, Vermillion, now working fixed and mobile, made his solo flight and the gang is wondering how long before he'll come up with /AM. ZIQ's 20-meter beam, just mounted on his house about a month, succumbed to the wind, and again is mounted on a telephone pole in the back yard. BWP and family, Flandreau, are vacationing in Minnesota. The first report from Huron in more than a year was received from NGM, giving a traffic count of 68 for June. Jack has a Far East sked on 20 meters. Traffic: KØFCR 144, WØOJQ 15, LBS 14, 8MV 12.

MINNESOTA — SCM, Charles M. Bove, WØMXC — Asst. SCM: Vince Smythe, ØGQQ. SEC: ZDU. RM: OMC. PAMs: JIE and UCV. The Excelsior Radio Club now has a station with the call CYE. DXZ is moving his QTH to Monticello and has room for an antenna farm. 8HB is going to the U. of M. TGF has a new beam on 20 meters and is looking forward to a lot of DX. Are you a member of 8YG's Elite Club on 3820 kc.? OTU has moved to a new QTH at Belle Plaine. DQL has been taking over Tenth Regional on Tuesdays to help out ITQ during the summer months. HFY assumed duties as Manager of the MSN Junior Net. With all the Novices now on the air we wish you would all check into this net at 1800 CST on 3690 kc. This is your opportunity to learn the art of good traffic handling and at the same time you will be building up your code speed. HUV now is on the air operating mobile. TKX has been on the air using a Transistor. He has had no trouble working hams within a ten-mile radius. The Mobile Amateur Radio Corps, Inc., furnished all the communications in the Aquatennial Parade in Minneapolis. This also

(Continued on page 78)



THE PROBLEM of TVI has many phases, and relatively little has been written about receiver TVI. After spending much time and toil in TVI-proofing a transmitter, many an ardent amateur is surprised and disgusted to find that his receiver is causing interference, often of a fair magnitude. This is especially true if the receiver is of an old vintage.

Tests were conducted in our lab and in the field on various models of receivers to determine possible causes. In all cases, the interference was traced to either harmonic or fundamental radiation of the high frequency oscillator in the receiver. Receivers covering the appreciable frequency range of 2.1 per band, 3.1 per band, etc. present a problem in design which has a bearing on this. The high frequency oscillator in the receiver must operate over a wide frequency range with a large change in tuned circuit impedance. Reliable oscillation must be maintained at both ends of each band under conditions of low line voltage, aging tubes, and production tolerances in manufacture. This dictates that the feedback used to obtain oscillation be high — a condition which increases the harmonic content in a manner similar to that depended upon for multiplier use in a transmitter.

The shielding of the receivers was found to be generally satisfactory. Radiation of the harmonics of the high frequency oscillator was traced to leads connected to terminals on the receiver chassis sometimes accidently resonant in one of the TV channels. Coupling from the receiver oscillator was mostly by way of the cable harness in the receiver. Additional filtering of the B plus for the oscillator generally helped but little.

The best cure found was to series connect 1.5 uh chokes in the offending leads and by-pass them with .005 to .01 ceramic condensers with short leads to the receiver chassis. This is the same technique used to filter leads in a transmitter. Naturally, any choke used in the speaker lead should have low resistance to prevent loss of audio power. Shielding the B switch leads external to the receiver also prevents harmonic radiation and also helps to keep transmitter power out of the receiver. An odd twist was that radiation from leads connected to the antenna terminals was negligible, although this depends to some extent on the vintage of the receiver and the model.

BILL BARTELL, W1PIJ

included all other activities, such as the boat races and the Aquafollies. GTX has nine stations in his Douglas County Emergency Corps. KMR is in the service and located at Camp Gordon, Ga. LPX is moving to a new QTH. FUX is putting 150 watts on 40 meters. The St. Paul Radio Club, Inc., supplied four pack sets at the 19th Keller Open Golf Tourney. The packs received a very thorough shakedown and came through with flying colors. These sets were built for emergency work and the schematics were published in the *Ground Wave*, the club paper. Traffic: WØDQL 271, HFY 269, DYD 257, SWB 234, KFF 229, UCV 156, CQY 100, KNR 69, GGQ 52, MXC 50, BUO 24, TJA 23, KFN 21, QYZ 19, IRJ 18, CID 15, GTX 15, WQM 15, FFU 14, HMV 14, HTX 13, HUV 12, FYT 8, OPA 7, EMH 6, CWJ 4, JNC 4, LIG 4, RA 3.

DELTA DIVISION

ARKANSAS — SCM, Fred E. Ward, W5LUX — Hot weather sure is cutting down our activities in Arkansas, but all are planning big things for the fall season. The Ozark Net is coming back to life and all bands are welcome to help out. We need traffic men to represent us on the NTS and move the traffic that they have for us. TID is new EC for Conway. QIP is leaving for school at Fayetteville. NLL is new PAM. OEF's OW now is ZXE and ZZT is a new call at Mountain Home. ØEPL is a new operator at Camp Chaffee and those boys sure have been running up some nice traffic totals lately. TNM is building a new final with a 6146 for the low bands. STU has moved to Little Rock and we probably will give him a workout with traffic this fall. VN is getting some real fine frequency measuring reports these days; his average error for three measurements was only 64 parts per million. Traffic: W5WBA 161, LUX 9, TID 7, EA 6.

LOUISIANA — SCM, Robert E. Barr, W5GHF — ORX reports a two months' visit through 9 different countries in Europe, and while overseas made personal arrangements for a number of choice DX contacts. He reports most stations seen were of simple design and homemade, but a few were of elaborate construction. Shreveport has a brand-new ham in WN5ACE. JET has new 32V-3. UDX is building mobile rig. VDU now lives in Monroe. DXL and ROY are QRL KFAZ-TV. TVW is building a.s.b. rig in New Orleans. UXE is active in New Orleans. MNT is go-between for the Hurricane and Crawfish Nets. EC and other AREC applicants should send their applications direct to the Section Emergency Coördinator, IUG, in Baton Rouge. GHF, TRQ, and MFT have serious TVI problems, with the nearest TV station more than 250 miles away. Conditions this summer have caused consistent daily reception of TV up to 400 miles in this area. How can a guy keep out of those signals? Traffic: W5NG 386, TVW 63.

MISSISSIPPI — SCM, Dr. A. R. Cortese, W5OTD — Our RM, WZ, says that the Mississippi Net is meeting on 3780 kc. every evening at 6:30. Let's get on the ball, fellows, and start calling in. WN5WQQ passed General Class exam and has a new Viking II. ZZZ is in Crystal Springs and WN5ZLP is in Columbus. WZ has a new TVIed exciter. YBH, WSF, and WDY have 10-meter walkie-talkies. YTW has a new 829B on all bands. SRT won a voltohmmeter and 5YDH won a D104 mike and switch. The Jackson Club put on a wonderful picnic. The committee did a swell job of planning and all events went off to perfection. The food, prizes, drinks, and weather couldn't have been better. Let's have more reports and traffic, fellows. Traffic: W5JHS 117, YBH 34, WZ 2.

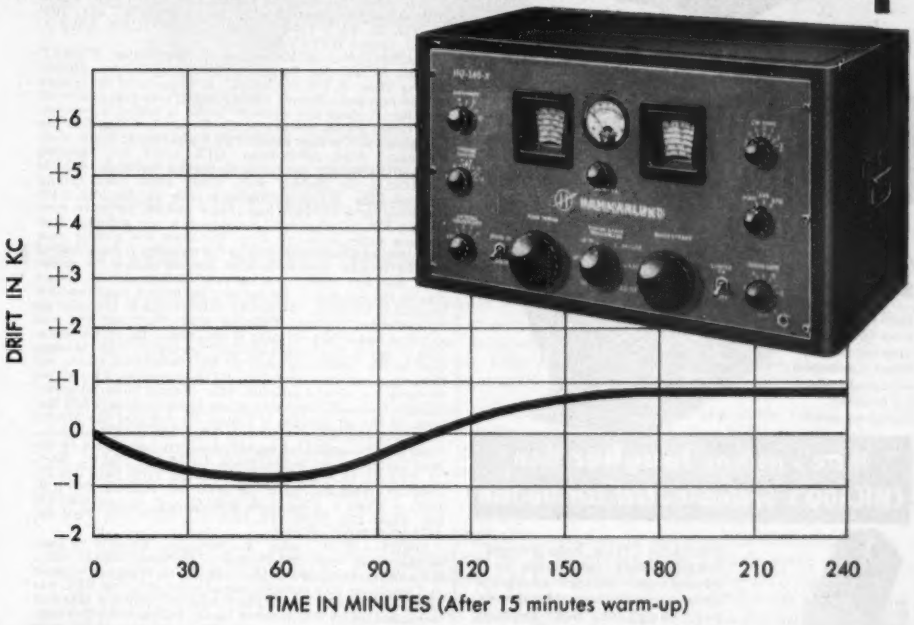
TENNESSEE — SCM, Mark M. Bowelle, W4CXY/-WLG — SEC: NJE. RM: AGC. PAM: QT. 'Phone net frequency 3980 kc. C.w. net frequency 3635 kc. YIP and VKE just missed BPL by a hair and PL (who has not missed BPL since he can remember) held up the heavy end of the load with nearly half of the section total for the month. OO stations MKB and YIP are working overtime to keep the gang from receiving "Grand Island QSLs" and OES FLW is keeping an eagle eye on 2 and 6 meters. The Bays Mountain Club station, ZJA, is beginning to move traffic. RHO has a new 300-watt rig, WQW 400 watts, and SCF is roaming 9 Southeastern states with an Elmac. UDS worked KU4AA at his new QTH with a downspout for a sky-hook. QT is our new PAM. Give him your full coöperation, please. IWV reports a terrible thing that points up the need for a net station to meet *every* net session or have an alternate on from his QTH. A lady in one of our larger cities took her own life because of despondency while a message from her husband in Japan that would have forestalled her action was in the mails from a station 200 miles away and arrived two hours too late. Had a station been on the net from that large city the message would have arrived some six hours before her action. Traffic: W4PL 1536, VKE 482, YIP 409, PFP 336, IWV 286, OGG 146, SCF 51, VUA 41, ZJA 31, OEZ 23, RHO 22, WGJ 18, RMJ 17, WGJ 14, FLW 9.

GREAT LAKES DIVISION

KENTUCKY — SCM, Ivan C. Kelly, W4TUT — With the heat meter bubbling at 100 degrees, activity was very low. KZF made 25 contacts in 20 minutes, which shows a station scarcity for the CD Party. His new 40-meter

(Continued on page 80)

HQ-140-X Frequency Drift less than .01% after warm-up



New Circuitry Improves Receiver Stability

The curve above shows the frequency drift of a standard production line HQ-140-X at 29 Mc after a 15-minute warm-up period. The same curve has been obtained from tests of a number of production receivers at different frequency settings and duplicates the curves for the original laboratory models.

The separate oscillator (6C4) and mixer (6BE6) incorporated in the HQ-140-X have contributed to this excellent stability.

Low-loss tube sockets, ceramic band switches, temperature compensating capacitors, zero temperature coefficient ceramic trimmers, and a bi-metallic compensating plate all help limit frequency drift to less than 0.01%. Additional frequency stability is attained by applying regulated voltage to the oscillator plate and by the rugged construction of the entire oscillator section assembly.

Excellent stability characteristics are further reason for selecting the HQ-140-X for your amateur operations. For detailed information about this fine receiver write for Bulletin F1.

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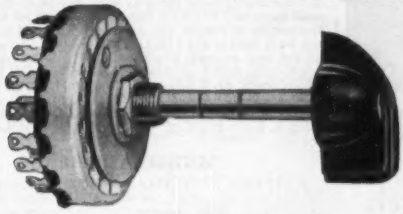
final will make him separate 813s on all bands. The Paducah Club now is affiliated with ARRL. URF has new 1st-class 'phone commercial license. MEY has gone to Baltimore with Bendix. JUI still is fishing — too hot for him to run the new NC-183D. 8KE was flown to a hospital up East for further polio diagnosis but will be operating portable from that location just as soon as possible. JPP, with OJK's help, almost got up a new 75-meter antenna. JPP also is going mobile. CDA finds WX too hot for radio since his return from Europe. UWA tours to a gang of Tennessee hams. WHC now is a lt. col., QSYing to Ft. McClellan. Everything is being lined up for full swing on the Kentucky 'Phone Net. KRY is handling lots of G.I. patches. ODK/9, fishing in Wisconsin, has kept 40 meters hot with CMP, KRY, JPP, and TFK skeds. Traffic: (July) W4WHC 354, JPP 41, NIZ 29, TUT 14, UWA 12, CDA 9, JUI 6, URF 3, OJK 2. (June) W4TAV 660.

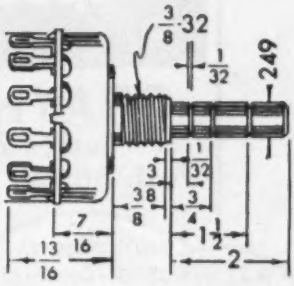
MICHIGAN — SCM, Fabian T. McAllister, W8HKT — Asst. SCMs: Joe Beljan, 8SCW; Bob Cooper, 8AQA; Mickey Wills, 8CPB. SEC: GJH. With many of the fellows now on new and different factory shifts, plus many more on vacation, it looks like summer traffic is taking a beating. At a recent picnic meeting of the Buzzards Roost Net the following officers were elected: JYJ, chairman; TDO, vice-chairman; AQA, secy.-treas. QIX spent his vacation visiting the boys in the northern part of the State. AQA is vacationing up Halifax way, doing some tuna fishing between CQs. WXO is running a class for Novices, with emphasis on TVI. IQA has a new mobile, so move over fellows. FX (of all people) is sporting a new antenna, new antenna tuner, and new bug. We knew the mobile urge wouldn't last long with him! FGB is using a base-loaded 60-foot vertical, complete with ground radials. It works good, too, but don't try it on your 50-foot city lot. Dean also is the sparkplug behind the beginner's code-practice sessions in his area, on 1890 kc. GB returns to life after an eighteen-year absence. Welcome back, Carl, and you will still find lots of the old calls in use, plus a lot of new ones. Just to prove that it isn't always "beginner's luck" he says that in the past sixty days he has worked all states, all Canadian provinces and lots of DX, including VK; all on 75 watts to a vertical antenna. After putting up his 40-meter folded dipole TIC says it is a new band for him. FLM has been off the air because of illness. He received the MARS Station-of-the-Month award for May. Our congratulations. Ken. RXY, our EC for Ingham County, has moved to the Soo. Traffic: (July) W8ZGT 555, URM 106, IQJ 91, NUL 77, JYJ 52, IKX 31, WXO 29, FX 22, DLZ 19, FGB 17, TBP 17, HKT 14, ELW 13, SCW 13, FSZ 10, WVL 8, FFG 6, FLM 4, ZXC 3, EGI 2, QIX 2. (June) W8YIN 567, FLM 172, ELW 115, IKX 111, RTN 100, FBV 66, EGI 17, IDC 15, TQP 8.

OHIO — SCM, John E. Siringer, W8AJW — Asst. SCMs: C. D. Hall, 8PUN, and J. Erickson, 8DAE. SEC: UPB. RMs: DAE and PMJ. PAM: PUN. With hot weather and vacations July activity was at a low ebb. One BPL was made and that by JAR. The CACARC Summer Hamfest welcomed about 500 assorted hams, XYLs, and offsprings. PBZ managed the games while JNF took care of the prize drawing. The OCARA is conducting a drive to increase its membership of clubs and nets. The Council, in addition to discussing current problems and making recommendations to ARRL, sponsors the Worked All Ohio Counties Award, conducts the Intrastate QSO Party, and awards a trophy to the highest scoring Field Day member group. VM is proud of his new Harvey-Wells transmitter. According to WE, the State Patrol still needs about 35 operators. ZAU spent three months in New Mexico during a business trip. HUX, pinch-hitting for PUN, added considerable glamour to the Dog House Net. JAR is currently vacationing in Florida. BZD operated portable and mobile VE3 during his vacation near Georgian Bay. AQ is vacationing in Maine. ZJM is rebuilding with p.p. 813s in the final. AVT is operating portable W2 for a couple of months. 3QCI (Pittsburgh) surprised the West Park Radiop Net, 29,520 kc., by calling in on 8/3. Quite a groundwave haul! FRD needs Asia for WAC on 80-meter c.w. He runs 20 watts! He did, however, become the elated pappy of his 5th child recently. Officers of the newly-formed Ashland Amateur Radio Club are BTW, prexy; ECU, veep; and GAX secy. PUN, who spent his vacation in the Hillbilly Area of Tennessee, has gone on s.s.s.c. with an SS75. Only three bulletins were received this month. The Cincy *Mike and Key* states that VLV has moved to Sunny Florida. FHW vacationed in Miami. MAL has forsaken 10 for 40 meters. MXY has made his General Class and is operating with 32V-3 and HQ-129 combo, and HQH is now in Japan. Code classes are held on 28 Mc. at 2100 on Tue. and Thurs. The *Q-5* out of Springfield informs us that CAS showed an FB film of a bull-fight which he took in Spain a year ago. IRT has concocted a frequency standard using transistors which shows great promise. DCJ spent his vacation in Canada, and AYC is making money by the bushels in his new trading store business. The Columbus *Carascope* informs us that on July 16th, 17th, and 18th the CARA mobiles provided transportation during the bus strike. They handled one baby case, transported aged and infirm people about the city, and, in the evenings, provided transportation for the Hospital Federation. Your SCM

(*Continued on page 82*)

MALLORY HAM BULLETIN





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It is probable that most amateurs are familiar with the operation of Mallory 3100-3200 series rotary selector switches when used in antenna changeover circuits of the type commonly employed in converters, signal boosters, and RF pre-amplifiers. However, it is doubtful that very many amateurs are fully aware of the extent to which these compact switches can be used around the ham shack to solve other switching problems.

In many respects, the Mallory 3100-3200 series switches offer more genuinely useful features to the amateur designer than any other switch, or family of switches, made. They are small and compact, which means they can be extremely useful in portable test equipment or Civilian Defense gear. Their axially positioned solder lugs reduce the over-all panel space required for mounting, and at the same time permit more convenient wiring.

In spite of their small size, the Mallory 3100-3200 switches do not sacrifice efficiency or reliability of operation. Each terminal-contact is fabricated from a single piece of metal to reduce circuit loss and the possibility of intermittents. At 6 volts DC, these contacts will carry 10 amperes of current without excessive heating. At 250 volts DC, 50 milliamperes may be made and broken continuously without harm to the switch. Triple X grade phenolic insulation, used throughout, assures excellent high frequency operating characteristics for coil and crystal switching in either transmitters or receivers.

The unique Mallory 3100-3200 switch design has been field-tested thousands of times as an important component in expensive commercial test equipment. Research laboratories use it daily as a part of precision measuring devices. And it is recommended consistently time after time in published plans detailing the construction of ordinary and highly specialized electronic apparatus.

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For your information, the Mallory 3100-3200 switch is made in 12 circuit combinations, in either shorting or non-shorting styles. Switches of 12 positions or less (30° indexing) are 1¼" in diameter; all others are 1⅛" in diameter, have up to 17 positions depending upon the number of circuits, and feature an adjustable stop mechanism. Bushings are standard ⅜" in diameter and have a #32 thread. Shafts are ¼" x 2", and are pre-grooved at popular lengths to permit accurate cutting. An attractive molded knob is supplied with every switch.

Why not visit your Mallory Distributor today, and see these useful switches first hand? And while there, don't forget the other dependable Mallory parts you may need . . . controls, rheostats, potentiometers, pads, tubular capacitors, transmitting capacitors, dry electrolytics, disc rectifiers, vibrators, vibrator power supplies, and enamelled resistors.

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does not believe in Santa Claus but now and then one-dollar bills are received through the mail. Closer inspection reveals that these are actually intended for the QSL Manager. In all cases these contributions are returned to the sender rather than forwarded to LJS. Send Norm only self-addressed stamped envelopes! Oh yes, many AREC registration forms are received here. This only slows down the operation. Send them to your EC or, if he is unknown, mail them to UPB, P.O. Box 82, Lockland 15, Ohio. Sending the proper things to the proper people will greatly reduce the work load of the LOs and will make for greater efficiency all the way around. Traffic: (July) W8JAR 325, FYO 283, AMH 136, DG 111, RO 97, DAE 77, HNP 73, KNX 58, AL 52, SRF 51, LMB 43, CTZ 38, DL 29, BN 27, WE 23, KIH 15, ZAU 14, CTO 13, HUX 12, GZ 11, AJW 9, EIV 8, RN 7, BLS 6, TLW 6, WRL 6, AQ 4, BZD 4, CUD 4, CRA 3, EQN 2, ET 2. (June) W8BN 55, PMJ 4.

HUDSON DIVISION

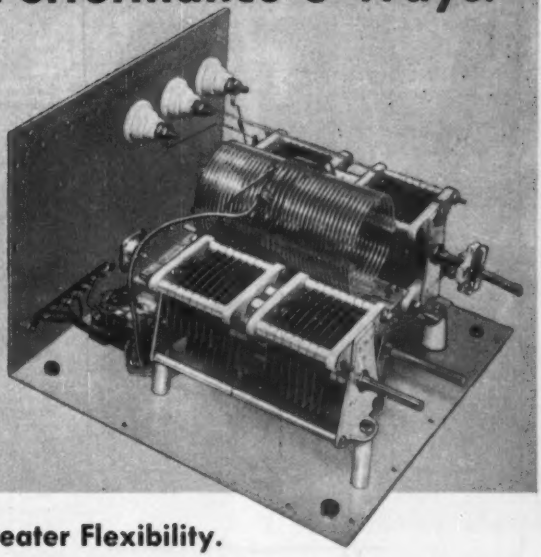
EASTERN NEW YORK — SCM, Stephen J. Neason, W2ILI — SEC: RTE. RMs: TYC, KBT. PAMs: IJG, JQI, K2CA. BSH reports that two more of his students passed the Novice Class exam. JFB is rebuilding his 144-Mc. gear plus a new mobile rig and reports that v.h.f. is definitely on the upswing in Dutchess. K2BUI has moved to Buffalo; Dave is very active on NYSEPN. The RVWARS held a very successful family picnic and auction recently. The Club is making a drive for new members. Please contact EWO for information. K2BSD has a new center-fed antenna on 3.5 Mc. Congrats to MRQ on receiving his 20-w.p.m. sticker. MHE is QRL but will be active in the next V.H.F. Contest. IFP was awarded a Section Net certificate for activity on TAN. EZP is building a new mobile rig with VFO control for operation on 3.8 Mc. OZY is using an 813 with 85 watts input plus a Meissner VFO on 3.8 Mc. OXP is too busy flying these days to get on the air, with model building and radio control also getting some interest. LRW has completed building a new 700-watt rig for APF. K2DYO is active again from White Plains. KN6BFC is operating portable from Gloversville. TYC has been endorsed as RM and ORS. Congrats to IFP, who made BPL while operating from a Boy Scout Camp in Vermont. The AREC-e.d. group headed by EC YXE made a fine showing in the recent A-bomb test held in Troy. Paul was assisted by DGW, UH, GPH, FVK, WIK, KN-2BRI, and ILI. RTE, our SEC, reports that many ECs have failed to send in their certificates for endorsement. Ted will appreciate your prompt attention to this matter so that if necessary new appointments can be made. Traffic: (July) W2EFU 239, IFP/1 200, TYC 107, K2BUI 46, W2ILI 45, LRW 40, CFU 38, MRQ 28, IVP 10, JFB 10, K2BSD 8, W2BSH 5. (June) W2TYC 105, KBT 23.

NEW YORK CITY AND LONG ISLAND — George V. Cooke, jr., W2OBU — Asst. SCM: Harry Dannals, TUK. SEC: ZAI. RM: VNJ. PAM: YBT. Summer has been good for all of us; and to sit here on the shore of a beautiful lake, deep in the mountains of Pennsylvania, making up this report, it becomes a bit nostalgic to make this my final report as SCM for this section. The last four years have been the best experience any ham could have to realize the deep importance and responsibility all hams have for their chosen hobby. It is with the deepest appreciation that thanks go to all who have made these years so profitable and worth while in trying to bring to the fraternity here the most and best of what our hobby stands for. To my successor, YBT, the new SCM, my wishes go for a most successful administration, and the fullest coöperation will be given him in all ways. KGN, Brooklyn EC, is back on the job after his appendix operation. KN2BGM is interested in amateur TV on 432 Mc. and would like to know of other stations in the section likewise. BFN has a 28-Mc. ¼-watt pack set for all emergencies. ZAI was hospitalized for 6 weeks after a serious accident but is back on the job as SEC. JZX gained amateur radio lots of publicity by appearing on two TV shows over WNBT during July. DHC now is the authorized RACES station for Nassau County c.d. UBW is going 2-meter aeronautical. KEB/KFV has a new Johnson Viking II. The East Meadow Radio Club has been formed in the town and meets at the Meadow Lark School. 5RVY is visiting Nassau and is participating in the 10-meter AREC Net. ZRA, son of GG, is stationed at Atlantic Highlands with the Air Force and keeping home skeds on 144 Mc. TUK vacationed in VE-Land, working 75-meter mobile. EGI is back from the Far East, where he had the call KG6ACY, and will QSL from his Brooklyn QTH upon request. VNJ, RM for the NLI Traffic Net, reports summer activity at a high level, with AEE, LPJ, MJO, OMG, and GXC keeping things alive with consistent attendance. ZPG reported into Queens AREC Net from North Carolina during an extended motor trip. LGK wants to organize an all-ham orchestra in Queens. BQM, Lake Success Club prexy, states the Club's Field Day score was 50 per cent higher than last year and that Club 20-meter 'phone DX is on the increase. OBE changed his QTH from Williston Park to Smithtown. PF spent 2 weeks at Fort Monmouth and operated K2WBB and K2USA. K2BGZ has been called up by the Army. OMG received his Section Net certificate for good work and attendance in the Teen-Agers Net,

(*Continued on page 84*)

Boost Station Performance 3 Ways!

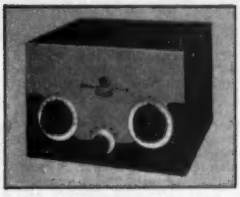
Johnson MATCH BOX



BANDSWITCHING—For Greater Flexibility.

RECEIVER MATCHING AND MUTING—For Improved Performance.

INCREASED POWER TRANSFER—From Transmitter to Feed Line.



Dials calibrated 0 to 100, bandswitch positions for 80, 40, 20, 15, 11 and 10 meter bands.

Rear view showing coaxial RF input connector, antenna connectors for RF transmission lines, and terminal strip.

Bandswitching on 80, 40, 20, 15, 11 and 10 meters, the feature-packed JOHNSON "Matchbox" performs all transmission line matching and switching functions required in a medium powered amateur station. Revolutionary circuit design does away with the annoying use of "plug-in" coils, and completely eliminates antenna lead tapping, necessary in other antenna couplers.

The "Matchbox" is designed for use with any transmitter having up to 250 watts maximum power input, and a PA plate voltage not exceeding 1000 volts. Matches a 52 ohm coaxial link line to reactive and non-reactive loads ranging from 25 to 1250 ohms for balanced lines, and 25 to 3000 ohms for unbalanced lines.

Tuning and loading is easily accomplished with two convenient front panel controls. All "Matchbox" connections are conveniently located at the rear of the unit.

Attractively finished in maroon and grey—supplied as an assembled, wired, and pretested unit. Complete operating instructions included. Dimensions: 9⅞" wide, 10½" deep, 7" high. Weight approximately 6 pounds.

Catalog Number 250-23

$49.85 AMATEUR NET

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CAPACITORS, INDUCTORS, SOCKETS, INSULATORS, PLUGS, JACKS, DIALS, AND PILOT LIGHTS

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which is managed by JOA. DUP, Bronx EC and C.D. Radio Officer tells us 30 portable 2-meter rigs are ready for use by AREC and c.d. nets within the city and are available both for natural and enforced emergencies. Any amateur desiring the complete portfolio of up-to-date TVI literature should contact or write DIC, chairman of the Hudson Division TVI organization. K2CFB reports that when fire damaged the property of a vacationer in the Provinces, W2MUM and W2RDK, at Levittown, with the help of VE1HO and W2FVI/VO4, got the information to the Canadian Police and the CBC, and got the news to their man a full week before the normal end of his vacation. Traffic: (July) W2OMG 320, JOA 271, LPJ 216, JZX 186, EC 150, AEE 115, GXC 64, VNJ 42, DIC 32, LGK 30, KGN 21, LEO 18, BQM 17, YBT 16, PF 11, JBQ 10, MUM 9, OBU 6, WDT 6, BMK 2, IVS 2, OGX 2. (June) W2JZX 131.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: NKD. PAM: CCS. RMs: NKD, CGG, WCL. New EC appointments: UPY Hawthorne, K2BV Bergen County, WYU Franklin Lakes, DMJ Woodridge, and CXW Englewood. HWH has built a new portable rig for emergency work and has been giving it a good workout from his summer camp in New York State. KN2COQ is working fixed portable in Ocean Grove. IQD is moving to a new QTH in North Bergen. JKH has a new baby girl in the family. NUI and EYT rendered valuable assistance to the City of Bayonne during the recent interruption of the city water supply. Communications were supplied from the break in the water main back to city police headquarters. Both received letters of commendation from the City Council. K2BCK has returned to the air after a vacation up New England way. EKU is doing an excellent job as secretary of the RVRC. His bi-monthly club paper is an example of the good work Carl is doing. The RVRC station, QW, is proudly displaying a new OBS certificate. This station turned in a score of 10,350 points in the July 18-20 CD QSO Party. Participating were KN2s CAR, CHI, and BJP, K2BEV, W2s NQA, HJD, VPL, UK, EKU, LTI, and GXX. New hams in the section: K2DOX Bogota, K2EBL Asbury Park, and K2EBK Atlantic Highlands. VYB still is on the high seas. AGU is back on 20 meters again. The State Line Radio Club of New York and New Jersey was organized July 11th and held its first outdoor get-together on July 19th at the QTH of DTU, Pearl River. Charter members are SVS, OGP, YVP, QMV, ZTZ, DTU, and K2BPG. W2BPG is the acting secretary. HJD has a new Viking II kit. BAI commutes from his job to Jersey Shore daily. LYG is on 2 meters with new Gonset rig. BLC moved to a QTH in Watchung. KLA and KTV are spending time aboard U. S. destroyers in civilian capacity checking electronic gear. K2ALA is heard on 2 meters. K2BVD is heard on 10 meters. W2ZPD and IHS are a father-and-son combination. IIK now is active on 80 and 2 meters. NIF has 42 states on 80 meters. IIN is a member of the active TVI committee recently organized in Elizabeth. NKD is back from Camp with the New Jersey National Guard. NIE is heard mobile marine in New Jersey waters. YLS and BTG are heading for annual vacation trip to Maine. The GSARA emergency equipment building program is going very well. To date they have orders for 45 2-meter rigs from local hams. ENM is the banker in the deal and is having much fun. K2DHE has taken up flying in a big way. Look for him mobile airborne on 2 meters soon. Charlie commutes to West Orange frequently and will make good use of his air time for some good 2-meter DX. NUI, chairman of the License Plate Committee, asks that all radio clubs send him a letter stating the number of members who are in favor of call letter license plates for hams. He needs this information for ammunition in the new campaign coming up soon. Traffic: W2CUI 135, EAS 97, CTX 20, ZDH 12, NIY 2.

MIDWEST DIVISION

IOWA — SCM, William G. Davis, WØPP — KVJ reports that after a severe rain and wind storm on June 9th commercial and I.C.R.R. wires were out. Needing the office in Sioux Falls for train orders the Railroad called on DIT, who called BJH in Sioux Falls on 28.8 Mc. With the aid of a 'phone patch connection was established with Waterloo and the Railroad carried on. Ex-PZK, now MYR, has an XYL. YBV reports that the Cedar Valley Radio Club held its 2nd hidden transmitter hunt on July 24th. YBV's activities now are confined to mobile and KCHA. LFH is working on rewiring the Charles City High School. Two weeks vacation and the National Convention caused SCA to fail to make BPL for the first time in 20 months. On Aug. 2nd the Iowa 75 'Phone Net held its annual picnic. 9LKL, originator of the net, presented the current net officers with the roll call of the first net. QVA reports BLH has his new Viking II wired and on the air. IUY is back on TLCN after moving to Cedar Rapids. UWF returned from Labrador on sick leave. NYX has converted the ham shack to a nursery. TLCN will resume regular skeds on Oct. 5th and asks all Iowa operators interested in traffic to QNI at 6:45 P.M. on 3560 kc. FZO sends the story, "Operation Flash Flood," another tribute to ham radio. VFM is back after an absence of 7 years. Traffic: WØBDR 746, SCA 348

(*Continued on page 86*)

Get these 7 ALL-NEW FEATURES with RCA UHF 2-Way Radio

1. Low-cost tubes.
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4. Optional operation on as many as four frequencies.
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PROVED IN ACTUAL FIELD USE

The UHF equipment, engineered to highest RCA standards, has proved its merit in actual field use in five important systems. The new RCA UHF equipment is ready now to help you solve your problem of channel overloading.

FOR NEW FREEDOM
in radio operations, check RCA Ultra High Frequency 2-way radio.
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COMMUNICATIONS EQUIPMENT CAMDEN, N. J.

CZ 233, BVE 155, QVA 107, EHH 18, ERP 18, BBZ 13, LCX 12, BLH 5.

KANSAS — SCM, Earl N. Johnston, WØICV — SEC: PAH. PAM: FNS. RM: KXL. PAH, our SEC, has moved to a brand-new QTH at 444 Westview Drive in Manhattan, overlooking Manhattan and surrounding country. YLO, of Scott City, found a new use for his 110-volt emergency power plant. He lent it to the user of an electric wheel chair while he was on a camping trip. It also provided lights for the camp when needed. Wichita amateurs are busy checking rigs for TVI from channels 12 and 16. WNØOQZ is a new ham in Hiawatha and uses a 60-watt Eldico. LOP has the rig on 2 meters. OFR has new Bandmaster mobile rig. PH has a new radiotelephone 1st-class license. EZT and HAW expect to be active while attending college in California this winter, especially during contests. The KVRC now holds bi-monthly hidden transmitter hunts the 1st Fri. after meeting nights. GCD and OBO have moved to Wichita. ICV finally has his 12-volt Elmac mobile transmitter-receiver installed and is ready for that trip to Mexico this fall. OBO now has rediotelephone 1st-class license. TEM is back in Topeka and working with the CAA. AFN is new vice-pres./treas. of KVRC since GCD moved to Wichita. Traffic: WØNIY 182, BLI 156, FEO 146, HFP 57, KXB 18, WGM 18, MLG 15, ICV 8, BET 7, FDJ 6, DEL 4, LIX 3, LOW 2.

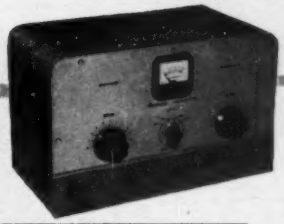
MISSOURI — SCM, Clarence L. Arundale, WØGBJ — SEC: VRF. PAMs: AZL and BVL. RMs: OUD and QXO. The St. Louis University Amateur Radio Club has elected the following officers: AJE, pres.; OBA, secy.; ETW, vice-pres.; and GFF, treas. CPI maintained schedule with BVL while BVL was on National Guard maneuvers in Wisconsin. QXO and 4PL, with their XYLs, took a vacation trip to the Smoky Mountain National Park. 9LHB/Ø now is operating from Kansas City with a Viking II and an SX-25. He will be remembered as one of the former operators at KG6FAA. HUI is in the hospital recovering from surgery. GAR has qualified for a 2500 Traffikers Club certificate and JXJ qualified for the 5000 certificate. BZK is new ORS and likes his new automatic bug. WAP is having some trouble with his SX-71. JEU is having trouble keeping a suitable antenna up. WNØMRQ has passed his General Class examination. EBE has installed an 85-kc. band-pass in his Collins 75A-1 and reports excellent results. JHY is installing mobile equipment in his car. WNØPDR is a new ham on the air. BPL certificates go to 9LHM/Ø and CPI. FIR now has a permanent position with KSD. FNN worked 96 DX stations in his spare time during the month of July. ETW thinks his travels are over for a while. We are nearing the fall traffie season so you are invited to participate in this activity. Be sure to mail your monthly station activity reports to your SCM. Traffic: (July) WØCPI 1280, QXO 376, W9LHB/Ø 350, WØIJS 197, GBJ 139, GAR 128, EBE 74, CKQ 38, BZK 33, HUI 32, OUD 31, WNØMRQ 27, WØKIK 19, IQY 13, BUL 11, ETW 11, SPR 4, JHY 3, GCL 1. (June) WØJXJ 85, ETW 2, SPR 2.

NEBRASKA — SCM, Floyd B. Campbell, WØCBH — Asst. SCM-NCS: Thomas S. Boydston, ØVYX. SEC: JDJ. PAM: EUT. AIN has been in Illinois, Iowa, Wisconsin, Minnesota, and South Dakota. Ex-9RR is now WØRS. Ex-9CBD is awaiting a new call. From Field Day reports there seems to be a lack of AREC members. All interested, please contact JDJ or CBH for application blanks. LEP has dropped the "N" from his call and is using 750 watts in a BC-610 cabinet. Anyone needing information on jiggers should contact KXD at North Platte. NET has a three-element 10-meter beam atop that 65-foot tower. A copy of *The Prairie Dog's S-S-S-S-Barks* was received from South Dakota. THF and KYM have joined the "Dogs." With RTTY and a new 500-watt final CIH is pretty busy. The Nebraska State Civil Defense communication plan (RACES) has been approved. JDJ has been appointed and approved by FCC as Chief Radio Officer. A c.d. station also has been authorized. The State is divided into 5 mobile support areas. The plan calls for a State Net Control Station with 5 supporting control stations (one from each area). There are 3 frequencies in the 3990–4000 kc. segment and 5 frequencies in the 3500–3510 kc. segment. Those wishing to become RACES stations and participate in this set-up, please contact F. B. Johnson, WØJDJ, 820 So. 44th, Lincoln, Nebr. Traffic: (July) WØBUR 172, VYX 21, QHG 18, QOU 13, EGQ 11, CBH 10, ZJF 10, HQQ 8, ORW 8, TIP 8, HTA 7, WR 7, MJK 5, MAO 4, THF 4, BWK 3, BEA 2, IAY 2, LSV 2, VAS 2 DJU 1, LRK 1. (June) WØJDJ 26, RDN 3, AIN 1.

NEW ENGLAND DIVISION

CONNECTICUT — SCM, Roger C. Amundsen, W1HYF — SEC: LKF. PAM: FOB. RM: KYQ. CN-3640, CPN-3880, CEN-29,580 kc. RTB and IPQ were mobile in Maine and Quebec. PHP is new Communications and Radio Officer for Area 4 C.D. APA got No. 120 on DXCC and has 850 watts on 40-meter 'phone without TVI. TD still is on 146 Mc. only. Hamden is building a new c.d. center. UNG is busy with a new job. ZL now has worked 202 countries. LGN's widow still has his 10-meter gear for sale. QIS reports lots of visitors at AW. BVB says signals are so good

(*Continued on page 88*)



Heathkit AMATEUR TRANSMITTER KIT

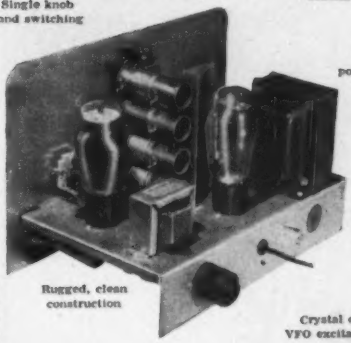
Range	80-40-20-15-11-10 meters
6AG7	Oscillator - Multiplier
6L6	Amplifier - Doubler
5U4G	Rectifier
105-125 volts AC 50/60 cycles 100 watts	
Size — 8½" high x 13½" wide x 7" deep	

MODEL AT-1

$29.50

SHIPPING WT. 16 LBS.

Here is the latest Heathkit addition to the Ham Radio field, the AT-1 Transmitter Kit incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, standby switch, key click filter, AC line filtering, good shielding, etc. VFO or crystal excitation-up to 35 watts input. Built-in power supply provides 425V @ 100MA. Amazingly low kit price includes all circuit components, tubes, cabinet, punched chassis and detailed construction manual. (Crystal not supplied.)



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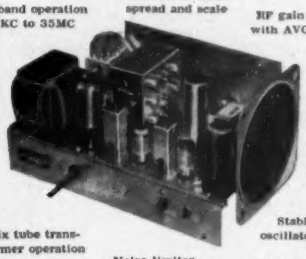

Range	535KC to 35MC
12BE6	Mixer oscillator
12BA6	IF amplifier
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12A6	Beam power output
5Y3GT	Rectifier
105-125 volts AC 50/60 cycles 45 watts	

A *new* Heathkit AR-2 Communications Receiver. The ideal companion piece for the AT-1 Transmitter. Electrical band spread scale for tuning and logging convenience. High gain miniature tubes and IF transformers for high sensitivity and good signal to noise ratio. Construct your own Communications Receiver at a very substantial saving. Supplied with all tubes, punched and formed sheet metal parts, speaker, circuit components, and detailed step-by-step construction manual.

MODEL AR-2

$25.50

SHIP. WT. 12 LBS.

CABINET

Proxylin impregnated fabric covered plywood cabinet. Ship. wt. 5 lbs. No. 91-10. **$4.50**

THE IMPROVED *Heathkit* GRID DIP METER KIT

- **Pre-wound coil kit**
- **Range — 2MC to 250MC**
- **Meter sensitivity control**
- **Compact one hand operation**
- **Headphone monitoring jack**
- **Transformer operated**

The invaluable instrument for all Hams. Numerous applications such as pre-tuning, neutralization, locating parasitics, correcting TVI, etc. Receiver applications include measuring C, L, and Q of components, determining RF circuit resonant frequencies, etc. Thumbwheel drive for convenient one hand operation. All plug-in coils are wound and calibrated (rack included). Headphone panel jack further extends usefulness to operation as an oscillating detector.

MODEL GD-1A

$19.50

SHIP. WT. 4 LBS.

Two additional plug-in coils are available and provide continuous extension of low frequency coverage down to 355KC. Dial correlation curves included.
Shipping Wt. 1 lb. Kit 341. **$3.00**

HEATH COMPANY
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he has no OO report. ODW is busy repairing gear. BDI had a busy month going to Texas and Maine. RAN wants ORS appointment. NLM had ORS and EC certificates endorsed. Although handicapped by being blind, Ev still gets his certificates in for endorsement. What is your excuse? OGQ is on 2 meters from new QTH in Waterbury. KV renewed ORS appointment. YCQ has a new rig. TZP is finishing his homemade double conversion receiver. FRL has a Cyclemaster. DBM is on 6-meter mobile. YON has a new receiver. YUF is a new call in Noroton for an ex-W3. We need more news, gang. Traffic: W1SJO 359, AYC 124, AW 104, LIG 97, KYQ 91, RRE 79, UNG 50, LV 37, QJM 25, QV 17, BVB 14, HYF 13, KV 12, BDI 11, ZL 4, ODW 1. (June) W1ODW 7, PHP 6, NLM 4.

SIXTH ANNUAL
CONNECTICUT QSO PARTY
October 24-25, 1953

All Connecticut amateurs are cordially invited to take part in the Sixth Annual Connecticut QSO Party to be sponsored by the Connecticut Wireless Assn.

Rules: 1) The Party will begin at 5:00 P.M. EST October 24th and end at 11:00 P.M. EST October 25th. 2) Any and all amateur bands may be used, and either 'phone, c.w., or both. C.w.-to-'phone and cross-band contacts are permitted, but no extra credit is allowed for such QSOs. 3) the general call will be "CQ CN" on c.w. and "CQ Connecticut" on 'phone. 4) The same station may be counted but once regardless of band. Mobile, portable and home stations covered by the same station license all constitute the same station. 5) Exchange names of town areas. 6) Score 1 point per contact; multiply contact points by number of town areas worked for final score. 7) Reports must show times of QSO, call of stations worked, town area of station worked. All reports must be postmarked no later than November 15th and should be sent to R. Newkirk, W1VMW, 35 Lafayette St., Hartford, Conn. 8) Special recognition to the high scorers *and to the highest-scoring Novice*. All decisions of the C.W.A. Contest Committee will be final.

Here is an opportunity to see how many Connecticut stations you can work in a 30-hour period. Get on the air October 24th and 25th and meet the gang around your section!

MAINE — SCM, Bernard Seamon, W1AFT — SEC: BYK. RM: LKP. PAM: BTY. SGN meets Mon. through Fri. on 3960 kc. PTN meets Mon. through Fri. on 3596 kc. at 7 P.M. As this is being written your SCM has just returned from a quick inspection of a serious forest fire in the Sanford-Springvale Area. Our able SEC, BYK, is on the job assisted by York County EC LBJ and mobile stations SWZ, CMO, LHA, RPT, QQY, and ROM with RSB, LBJ, TVB, KAS, VYA, SEJ, and others operating portable rigs at various points. PTL recently convoyed a smooth dryland cruise of the new cruiser *The Sea Hawk* from Bingham to Boothbay Harbor, much to the amusement of the gang on 3960 kc. HUL and TBZ are having some hot and heavy chess games on 10-meter ground wave. HXQ got in with them recently and is suspected of unfair tactics(?). 2RXZ/1 is going great guns on 2 meters. BKU's YL Polly now is WN1YTF and is on, thanks to a rig loaned by VYA. We had a fine visit from BDI, Ed Handy of the Headquarters Staff, during July. TWR was a recent visitor at TTM in New Hampshire. Your old SCM would like very much to have some applications for OPS, ORS, or other League appointments. Just drop me a line requesting application blanks or any information you may desire. Let's show the League that Maine is on the ball not behind it. Traffic: W1LKP 95, AFT 33, TWR 25, BX 24, OHT 21, VV 21, EFR 9, UZR 8, MFU 6, VXU 6, BOC 5, LNI 4, IXC 3, PTL 3, SUK 3.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., W1ALP — Appointments endorsed for another year: ADM Canton, SUR Mansfield, HUP Dover, MB Scituate, OLP Walpole, and SMV Cohasset as ECs. BHD and LMU as OES. HUP as OPS. KBN and BDU as ORS. UTH as OO. LMU as OBS. Sorry to have to announce the death of ZK, Mark MacAdam, of Brockton. Heard on 10 meters: RVK, TTS, TVI, LVH, MMY, TOU, TXU, VMD, DKF, RUG, LYF, and IDC. Mobile on 10 meters: HXK, OEF, QLC, WZC, QCL, UCP, NME, KLO, KTJ, PRR, K2ADA/1, 2IDO, now at Squantum Air Base, TRN, and UAR. UAR has a new 110-ft. tower. HXK has a Viking. 2HJY, ex-1ZH, visiting in Milton, is mobile on 10 meters. Heard on 75-meter 'phone: GAC, HP, HA, and LSA. Heard on 2 meters: OUM, YMC, VXW, QQI, YSF, and YHM mobile. SLW is on 80-meter c.w. and his son, SLV, is home on furlough. LOV is on 2 meters. OEF is mobile. ALP has been on 2-, 10-, and 80-meter c.w. GOU, WJJ, and WSN worked the Azores on 10 meters. IIM and SCS took a 1100-mile trip up into New Brunswick and were mobile

all the way. SCS is Manager for the summer of Drag Net. IIM is working on a "V" beam for 75 meters. 8MV has a new QTH and will have twelve-element beam on 2 meters. YQF is on 40 meters and will have the rig on 80 meters. WK, PXH, and BHW took part in the May F.M.T. BHD says the Everett Net will start working on 420-Mc. TV soon. AVY is very active on 75 meters, reporting into many nets. YIY is a new ham in New Bedford. 8SS is working on tuning units. TZU has a new Sonar transmitter in his car and is putting in an alternator. UID has a Globe King transmitter. The South Eastern Amateur Radio Assn. has TBS-50 with new c.c.o. tied in to an end-fed 250-ft. antenna. Visitors and new hams are welcome at meetings. WGN is active on 10 meters. Net certificates have been issued to UTH and WAG, who are in the Teen-Agers Net (TAN). 2JOA is Manager and I would like to urge the newer hams to take an interest in some kind of a c.w. net to keep up your code speed. UXL has 3 rigs on the air. The Sky Wave Net meets Tues. at 11 P.M. on 7184 kc. Write to WN1YQF for information. MKW is in the Island Net at 0700 on 3910 kc. 8MM has been operating KBN quite a bit. PU had a get-together at his QTH for the Deep Sea Drag Net. WLU is active on 75 meters in several nets. AOG is on 50 Mc. some. BB is getting ready for 160-meter tests and has a new doublet antenna. WN1WEJ, a new ham at Nantasket Beach, has an Eldico on 75 and an H420 on 40 meters. BGW has teletype on 40 and 80 meters. NF has a very nice gold QSL card to commemorate his 50th anniversary as a ham. OLP and QON took a trip to Nova Scotia and worked mobile. NF is on 2 meters and putting a Gonset Communicator in the car. MEG is portable on several bands at his camp in Hopkinton. AKN is on several bands at his camp in Wareham. CTW spoke on 220 Mc. at the National Convention. The Arlington Net had a family picnic at KNW's. DWO is working mobile on 75 meters. TVZ has a TBS-50D. The Bedford Radio Club has applied for ARRL affiliation. Officers are: TCG, pres.; NAD, vice-pres.; WIM, secy.; QZV, treas. JCK is going back to the hospital again. Traffic: (July) W1EMG 84, AVY 50, KBN 39, TY 38, UXL 37, UTH 35, SCS 31, BY 16, LM 10, YQF 7, WU 6, MKW 3. (June) W1KBN 229, 8S 128, NUP 80, LM 45, RRP 27, WLU 23, AOG 16. (May) W1NUP 82.

WESTERN MASSACHUSETTS — SCM, Roger E. Corey, W1JYH — SEC: KUE. RM: BVR. PAM: RDR. WMN meets at 7 P.M. Mon. through Fri. on 3560 kc. LPF is new OPS and ORS. TRB writes from Keesler AFB saying that he and VUT were married in August and both send 73 to the WM gang. UXK is a new member of the section, stationed at Ft. Devens and living in Leominster. Look for him on 10 meters. COI worked M1B for a new 'phone country. JYH vacationed in New Hampshire and operated from there in both July CD Parties, leaving TVJ and CJK to represent WM in the c.w. and 'phone parties, respectively. TVJ reported his highest traffic total this month and is building a higher-powered rig to help maintain his many skeds. AGM made two e.d. test runs during the month. BVR spent his vacation building Heathkit VTVM, condenser checker and resistance box, while UVI worked on a Heathkit AT1 transmitter. KFV has over 1 country per watt with his 35-watter and single-wire antenna. CLX assured his place as the section's leading DX man by working VQ7UU and CE9AA. After a three-year layoff, JYH tried DXing again and also worked the CE9, plus EA9AB, for two new ones. WEF has built a new rig using parallel 807s for all bands. GED is NCS of the Region 9 6-meter net which meets every Wed. at 6:30 P.M. UDK has a new rig on 40-meter 'phone, as do OM VBS and XYL VBT. EHH vacationed in Maine with his 50-Mc. mobile. RFU broke the 420-Mc. record with his 410-mile hop to Virginia. MNG, OBQ, and VNH took portable v.h.f. gear to one of the section's highest peaks and, after a successful tryout, hope to make the trip again for the V.H.F. Parties. Traffic: W1TVJ 381, BVR 45, JYH 17, RRX 16, TAY 15, HRV 14, MNG 14, JAH 6, OBQ 1, UVI 1.

NEW HAMPSHIRE — SCM, Carroll A. Currier, W1GMH — SEC: BXU. RM: CRW. PAM: UNV. Because these reports are written two months in advance I am writing this report the first of August and I think about everyone is away, for I have received just one news item. The Port City Amateur Radio Club has adopted a little girl who recently was hospitalized as a Club Mascot. A fine gesture, I am sure. The Concord Brass Pounders did themselves credit in the score that they ran up for the Annual Field Day activities. WUU now is having fun with new mobile rig. JSL has Viking II working FB with new ECO. Are you going to be one of those to get a WNH certificate this winter? Congratulations to QJX on making headlines in a recent issue of *QST*. IJB is building a new home with an ideal location for ham radio. QH8 reports a good time on 160 meters this past summer. Drop me a card with some news items for the column. Get in on the NHEN at 0900 Sun. on 3850 kc. with BXU and the gang; he is doing a good job. Traffic: W1GMH 53, VGX 35, POK 15, QJX 8, CDX 6.

RHODE ISLAND — SCM, Merrill D. Randall, W1JBB — SEC: MIJ. RM: BTV. RIN meets Mon., Wed., and Fri. at 7 P.M. EDST on 3540 kc. R.I. C.D. meets every Sun. at 10 A.M. on 3993 kc. RI 'Phone Net meets every Sun. at 11 A.M. on 1890 kc. The PRA's meeting nights now are

(*Continued on page 92*)

every Tue. at 8 P.M. All are welcome. The new location is at the Providence C.D. Center, corner of Roger Williams and Reservoir Ave. Practically the only specimen of the animal kingdom that hibernates in the summertime is the "ham." At least, the R.I. brood. No mail, no reports, just two no-air time, no nothing. Oh well, guess even the hard-working amateur deserves a vacation. TRX reports a wonderful vacation in W6-Land. ULG's recent trip through VE-Land gave his mobile rig and his fly-rod a workout. Both TRX and ULG found mobile conditions excellent. The NCRC is planning a code practice net for early fall. It will be on 160 meters unless a majority opinion dictates otherwise. Let's hear from you fellows who want a code session on the air—give us your ideas as to time, frequency, and speeds! Traffic: W1BVI 33, OIK 10.

VERMONT — SCM, Raymond N. Flood, W1FPS — SEC: NLO. PAM: AXN. RM: OAK. Asst. RM: TAN. FRT has been appointed EC for Washington County, PWB is new EC for Caledonia County. Just a few more and Vermont will have an EC for each county! AXN has a new mast up and is getting out better. That's all the news received on the mailing date. Send in more items if you want more reading. Traffic: W1RNA 151, OAK 95, AVP 28, VZE 6, AXN 4.

NORTHWESTERN DIVISION

ALASKA — SCM, Glen Jefferson, KL7NT — KL7PDG arrived in Kotzebue with his family, 75A-3, and other gear, and reports being on 75 with 40 and 20 meters to come when sky wires are hung out. PDG says he was glad to move out of Fairbanks S8 noise level but hopes W1RJB/KL7 is enjoying the three-element beam. AMZ and ATL are doing well with s.s.b. and are ardent boosters for that system. Maybe some of the gang can be converted? PQ and BK now are devoting full time to construction of KNTV on Channel 11.

MONTANA — SCM, Edward G. Brown, W7KGJ — MM has just been appointed Phone Activities Manager. Earl hopes the gang will support him and says that any ideas or suggestions will be appreciated. LIT is a married man now and has moved into his new home. MKB, now stationed at San Luis Obispo, Calif., is instructor in Army telephone work. SAW has been transferred to Spokane. TDW is a newly-appointed OPS. The Glacier Hamfest was a big success again this year with registrants from all over the State, quite a few from Canada, and two from the Canal Zone. Talks were given by Washington State Civil Defense Director, Montana Civil Defense Director, Director CPY, SCM KGJ, and several others. New calls reported are WN7s THE, TAP, TGG (an XYL), TGH, THM, and TGF, as well as W7TGU and QCP (an XYL). The Billings Club had an amateur radio display booth at the Midland Empire Fair again this year. TKB worked LU4ZO, Argentine Antarctic Exposition at South Orkney Island, on 7 Mc. Activity on the Montana State 'Phone Net has been wonderful the past few months. Now if we could get the same interest on the c.w. net Montana really would be rolling. Traffic: W7MM 47, OPM 14, SFK 13, EWR 10, TKB 10, FTO 6, PCZ 5.

OREGON — SCM, John M. Carroll, W7BUS — RLG, NYG, and ADX all signed up with AREC. Reports still coming in on Field Day activities indicate greater interest in v.h.f. and u.h.f. Stations in Yakima and Athena were heard at PL location near Battle Mountain Park. The Pendleton Club has a small source of supply for a.c. power plants. If interested, write the secretary. GDV is moving to W6-Land. He should contact the SCM there for appointment as ORS in that district. KR and FPT drove to San Francisco and back one week end to pick up a kw. rig for use in a non-TV area. We need nominations for SEC of Oregon. Traffic: (July) W7QPS 76, PRA 54, OSN 16, GDV 11. (June) W7OSN 13.

WASHINGTON — SCM, Laurence M. Sebring, W7CZY — RM: FIX. PAMs: EHH, PGY. JHX has gear on 420 Mc. and is experimenting on 10,000 megacycles. LVB has new 60-watt TVI-proof rig. The Apple City Radio Club now is affiliated with ARRL. PXA is glad to be back in the Northwest after a vacation in W1-Land. 6BWZ now is located in Spokane. HZV has Stancor mobile. NVB is mobile on 10, 20, and 75 meters. BRG rebuilt his rig using a pair of 807s in the final. NXN has radio control on his garage doors. OHI needs a baby sitter so he can take part in hidden transmitter hunts. The Valley Radio Club held its picnic at Lake Tannawax. RME and RVD are planning a 20-meter rotary beam to help out on DX. NDO has a new Heathkit transmitter. PFZ is located at Scott A.F.B. VARC made 3753 points on Field Day. MCU is the only amateur on Saipan. TGO built a VFO for his Viking. ATW returned from W6-Land and works 20-meter c.w. TKS is located at Wilkeson. BA and PGY made BPL as usual. OE has new antenna patch panel for easy antenna changing. The WARTS reports an average number of check-ins of 43.7 for the month with a high of 60 one evening. Traffic: (July) W7BA 1217, PGY 623, CZX 450, FRU 361, OE 218, RAQ 146, RXH 134, KCU 127, AMC 107, FIX 102, TH 69, KT 45, RTQ 44, BG 43, EHH 39, BLX 21, RT 20, AIB 16, QOU 12, NWP 11, LVB 8, GAT 7, EVW 6. (June) W7PYV 349, PQT 14, HNA 10.

(Continued on page 94)

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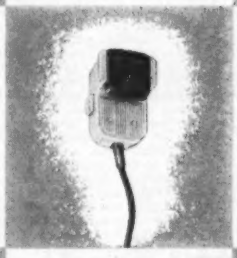

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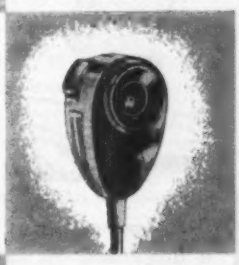

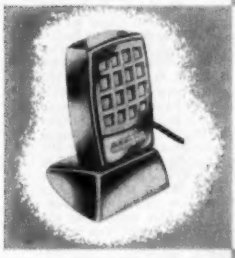

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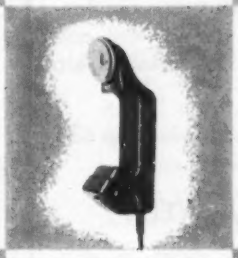

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PACIFIC DIVISION

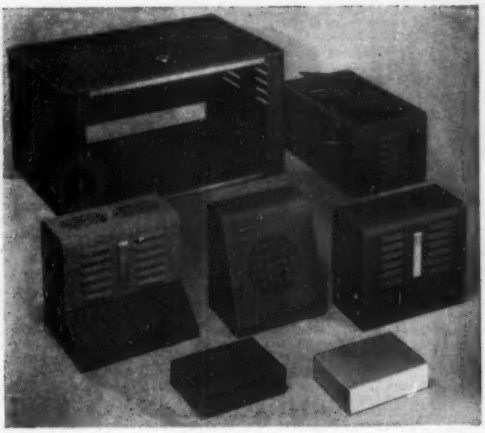
NEVADA — SCM, Ray T. Warner, W7JU — SEC: HJ. ECs: KOA, LGS, NWU, OXX, TJY, VO, and ZT. OPS: JUO. ORS: MVP. Reno and Sparks amateurs have selected 7268 kc. for emergency and disaster frequency work. Ten crystals were purchased for this frequency for a start which will be used in mobile and portable equipment. Reno activity still is on the upgrade. The Reno Club had a recent picnic on Mt. Rose. 6ZZ completed his first known 21-Mc. WAS by working JU. Where would you do the most good during an emergency? Filling out an AREC registration form merely means giving AREC officials your address and particulars of your station. No dues, no hard and fast obligations. Emergency equipment is desirable but not required. Every ham in the State is invited to apply to his EC or SEC for an AREC registration form.

SANTA CLARA VALLEY — SCM, Roy I. Cousin, W6LZL — The big news for this month is the signing of the License Bill by Governor Warren putting into law the Bill that allows the amateurs to apply for special plates for their cars bearing their call letters. The Bill stipulates that the plates will not cost more than three dollars plus the regular fee. Please do not write or phone the Vehicle Offices or Sacramento regarding this Bill as we will hear in due time, probably the first of the year. The Mountain View Club had a representative from H-P give a demonstration on the latest counter. The Monterey Bay Radio Club showed two interesting films and held a general discussion. The SCCARA had reports on Field Day and held a general discussion on the coming Bar-B-Q and participation in the County Fair with LZL as Fair Chairman. The CCRC meeting was held at QIE's residence in South San Francisco as guests of the NPEC. Bay Area Mobileers held a very fine outing at Riverside Grove in the Santa Cruz Mountains. It was very well attended and a good time was had by all. NPEC recently showed pictures of their Field Day activities and also reviewed pictures of past Field Days. PAARA had no meeting in July. AEV, our SEC, reports that San Mateo County is being broken down into sections for better control. Traffic: W6HC 164, WGO 53, SYW 20, NDY 18, TEK 18, AIT 12, MMG 4.

EAST BAY — SCM, Ray H. Cornell, W6JZ — Traffic men from the Bay Area had a swell meeting at the SCCARA Barbecue at San Jose, Aug. 8th. Group meetings afford an excellent way in which to meet the other fellows and are to be recommended for future get-togethers. The Acacia Radio Club, a Masonic Lodge affiliate, meets the 2nd Wed. at the Piedmont Lodge, 121 Vista Ave., Piedmont. BF is president. The SARO enjoyed a talk on antennas by Oliver Wright, GD. Fred Clapp gave an interesting talk on antennas and transmission lines at the July meeting of EBRC. Guy Black, RLB, our Asst. SCM, spent a few weeks in the East. Guy took his Communicator with him and gave the East Coast boys on 2 meters a thrill when he signed W6RLB. The CCRC met at the Richmond Club on its first visit to Richmond, where the club has first-class facilities located in the basement of the Hall of Justice. The Mt. Diablo Club had another FB auction in July. The Club paper, *The Carrier*, edited by IHR, is a good example of what a club can do to keep the members informed as well as to provide publicity. IPW has a TVI-proof kw. rig built around a 304TL. In a fringe TV area it is an accomplishment to construct such a rig. Bill Bennett, K6BDF, was a Field Day casualty. It took five stiches to sew his leg together after he wrapped it around a steel tent peg. QEN has a new Viking II kit with VFO. LJR has the back of his rig opening to and upon the work-bench sector of his garage, with the front end built into the wall of his shack. MEZ, of Concord, is an old-timer; his first ticket was received in 1919. LGW had a session with surgery but is OK now. Mary Ellen, PIR, is interested in traffic. The 8ky Riders had a picnic at Redwood Park. ELP has a new YL harmonic. PNA is a new station at Alameda NAS on 40-meter 'phone. B8Y is working DX on 40 meters. ANK is on 40- and 10-meter mobile. The 8ky Riders Net meets on 28,560 kc. each Wed. at 2000. All Bay Area 10-meter stations are invited to join the gang. The newly-formed Contra Costa Radio Club meets on the 2nd Wed. at Pittsburg. For information, contact SJC. The Mobileers held a picnic near Boulder Creek, July 19th. LL is Traffic Manager for MTN. K6FAL still handles the most traffic. Traffic: (July) K6FAL 681, W6IPW 313, K6BDF 123, W6JOH 103, HHX 41, JZ 14. (June) W6HHX 42, K6BDF 22.

SAN FRANCISCO — SCM, R. F. Cseikowitz, W6ATO — SEC: NL. Phone: PL 5-6457. We regret to state that Kenneth Hughes, CIS, the present Director of the Pacific Division, has advised all clubs that he will not be a candidate for reelection, because of the time required for his work with the State of California in its radio operations. Our congratulations go to Ken for the excellent job he has done for five years. More than one candidate has been nominated for the Directorship for the 1954–55 term. As this is a democratic organization, every member should vote in the director election, just as every qualified voter should vote in his city, state, and national elections. Pick any candidate you choose — BUT VOTE. Official Observer GQA recorded and sent cooperative notices to over fifty amateur stations during July — most having strong harmonics in

(*Continued on page 96*)



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the 7400- to 7600-kc. region. These violations have been heard from all parts of the nation and Canada. So, watch those harmonics, especially from 3700- to 3800-kc. fundamentals. OPL, formerly of the Mt. Diablo Radio Club, has been appointed ORS. Our congratulations to OZC on the return of his son-in-law from Korea. Rumor has it that a new amateur radio club is being formed at Inverness or Tomales, but no direct information as yet. Please join the Amateur Radio Emergency Corps in your area and help do your part in case of emergency or disaster — especially since the State Assembly, Senate, and Governor have all joined to pass the License Plate Act for amateurs' cars. Write or phone the Emergency Coördinator for your area. He will send you the proper application and will welcome your interest and assistance. The Emergency Coördinators for the San Francisco section are: San Francisco City — Wm. Green, W6BYS, 2800 Balboa, S. F. Marin County — E. P. Brown, W6KNZ, 168 Woodbine Dr., Mill Valley. Tamalpais Club — Wm. Humphries, W6ZUB, % Fire Dept., Woodacre. Sonoma County — Fred Plante, W6LOU, 927 Pacific Ave., Santa Rosa. Humboldt County — Ed Kirkwood, W6SLX, 3236 "S" St., Eureka. The meeting nights of the various clubs in the section are: Humboldt Amateur Radio Club, 2nd and 4th Fri., Civic Auditorium, Eureka. Sonoma County Radio Amateurs, 1st Wed., County Court House, Santa Rosa. Marin Amateur Radio Club, 2nd Fri., American Legion Hall, Larkspur. Tamalpais Radio Club, 3rd Fri., 7 Loma Ave., Tiburon. San Francisco Radio Club, 4th Fri., 51 Lakeshore Plaza, S.F. Highfreq. Amateur Mob. Society, 2nd Fri., 1625 Van Ness Ave., S.F. Cathay Radio Club, 2nd Fri. S.F. Naval Shipyard Radio Club, 1st Fri., S.F. The SFNSYRC meets on odd months at the Naval Shipyard and therefore no visitors are permitted. On even months meetings are held at the National Red Cross Bldg., 1550 Sutter St. Visitors are invited. Traffic: (July) W6SWP 344, W6ATO 9. (June) W6GCV 13.

SACRAMENTO VALLEY — SCM, Harold L. Lucero, W6JDN — RNR is mobiling to and from patients. FAV, the MARS station, at McClellan, had a nice turnout for Field Day. HTS/HSB bought new Collins 75A-3. LLR now is checking in with Mission Trail Net. TYC and EII are on regular check-in with Mission Trail Net for Sacramento. EII is handling lots of 'phone patches to the States from the boys in Japan. ATN still is building his VFO. RCT and QDA are Sacramento's most active mobileers on 75 meters. GNQ is mobiling on 75 meters with 8 watts. QDT has 200 watts on 20-, 75-, and 40-meter 'phone. EBL, AYU, and QCJ are active in civil defense. LZM is checking in on MARS. NJF is mobiling on 75-meter 'phone. GHP checks in on 75-meter 'phone occasionally. OXG has 2 watts on MARS 3307.5 kc. and Q5 Bay Area regularly. WN6PZG has dropped the "N." AK is active on 75-meter 'phone. QKJ is experimenting with T2FD antenna. NFH has gone low power on 75-meter 'phone. ASE is active on MARS. SUP is DXing on 20 meters. GCP has gone mobile on 75 meters. MUN is working DX on 75 meters with 4 watts. PLZ is new on 75-meter mobile. ROO is looking for contacts over 40 w.p.m. YFP is using center-loaded vertical on whip style on 75 meters. JTS and KPV moved to Southern California. YMZ is building the ultimate in 75-meter mobile unit. ZF's new QTH will be 741-4th Ave., Sacramento 14. ILZ, ZNE, MAP, QDA, JEQ, GDE, GVN, and KME furnished communication for the boat races July 19th from Sacramento to Rio Vista. LIZ was Net Control at the judges stand and ZNE was fixed. AVZ is active in AREC work. GHE has moved to Sacramento. AQR is from the San Francisco section and TDK is from East Bay. MCR, who is blind, is on 80, 40, and 2 meters with 40 watts. JDN paid the Redding Club a visit and made an Official Bulletin Station out of K6AKF. ZF now is Asst. SCM. I am looking for a number of stations that can be a liaison between the 'phone nets and the c.w. nets and mainly RN6. JDN received his new 75A-3. MUA has received his new Globe King and an S-76 receiver. FKI mobiled North for a few weeks. OMR and AKB spent some time at Medicine Lake. DDC still works plenty on 40 meters. N6NAK checks in on the Mission Trail Net. CMY is back on the air with 40 watts. UNT is giving up 75 for 40-meter c.w. WFW and ENW are on 420 Mc. LRW has a new beam on 20 meters. TLZ and K6ARR are on 75-meter 'phone with 50 watts. AJD is trying to get on 40-meter c.w. GHP, UNT, and ASE helped the Fire Dept. in a parade. Traffic: W6AVZ 23, K6NAK 15, W6ILZ 5, JDN 4.

SAN JOAQUIN VALLEY — SCM, Edward L. Bewley, W6GIW — SEC: KRO. RM: EXH. The hot weather in July increased the 2-meter activity. BCL has been going to the mountain tops with his mobile rig and can be heard nearly every week end. GQZ has been working Fresno consistently, and also many Bay Area stations. ONK and KN6BGJ also have been busy on 2 meters. Russ is running 12 watts to a sixteen-element beam and Bob is running 75 watts to a 32-element beam. Together they have logged about 40 stations. CF sounds very good with the new s.s.b. YGZ and his XYL announce the arrival of a harmonic, named Scott, on July 11th. OXB/7 now is 7TVI/6 and is back in Tracy. SAH is on a tour of the U. S. HKH now is being heard on 75-meter 'phone. SQP qualified for DXCC. Fresno hams furnished radio communications

(*Continued on page 98*)

36 *Engineered* BEAMS BY GOTHAM

All beams use any standard transmission line. Full data supplied with each beam. All GOTHAM beams assemble quickly, are adjustable over the entire band, and can easily be stacked on a single mast. Every beam complete with all hardware, fittings and castings.

6–10 M. BEAMS

S63N • Std. 6m 3-El. (No T), $12.95. 1 — 8′ Boom, ¾″ Alum. Tubing; 3 — 6′ Center Elements, ¾″ Alum. Tubing; 6 — 2′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

D102N • DeLuxe 10m 2-El. (No T), $18.95. 1 — 5′ Boom, 1″ Alum. Tubing; 2 — 6′ Center Elements, 1″ Alum. Tubing; 4 — 6′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

S63T • Std. 6m 3-El. T match, $14.95. 1 — 8′ Boom, ¾″ Alum. Tubing; 3 — 6′ Center Elements, ¾″ Alum. Tubing; 6 — 2′ End Inserts, ½″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

D102T • DeLuxe 10m 2-El. T match, $21.95. 1 — 5′ Boom, 1″ Alum. Tubing; 2 — 6′ Center Elements, 1″ Alum. Tubing; 4 — 6′ End Inserts, ½″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

D63N • DeLuxe 6m 3-El. (No T), $21.95. 1 — 8′ Boom, 1″ Alum. Tubing; 3 — 6′ Center Elements, 1″ Alum. Tubing; 6 — 2′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

S103N • Std. 10m 3-El. (No T), $16.95. 1 — 8′ Boom, ¾″ Alum. Tubing; 3 — 6′ Center Elements, ½″ Alum. Tubing; 6 — 6′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

D63T • DeLuxe 6m 3-El. T match, $24.95. 1 — 8′ Boom, 1″ Alum. Tubing; 3 — 6′ Center Elements, 1″ Alum. Tubing; 6 — 2′ End Inserts, ½″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

S103T • Std. 10m 3-El. T match, $18.95. 1 — 8′ Boom, ¾″ Alum. Tubing; 3 — 6′ Center Elements, ½″ Alum. Tubing; 6 — 6′ End Inserts, ½″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

S64N • Std. 6m 4-El. (No T), $16.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, ¾″ Alum. Tubing; 8 — 2′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

D103N • DeLuxe 10m 3-El. (No T), $22.95. 1 — 8′ Boom, 1″ Alum. Tubing; 3 — 6′ Center Elements, 1″ Alum. Tubing; 6 — 6′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

S64T • Std. 6m 4-El. T match, $19.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, ¾″ Alum. Tubing; 8 — 2′ End Inserts, ½″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

D103T • DeLuxe 10m 3-El. T match, $25.95. 1 — 8′ Boom, 1″ Alum. Tubing; 3 — 6′ Center Elements, 1″ Alum. Tubing; 6 — 6′ End Inserts, ½″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

D64N • DeLuxe 6m 4-El. (No T), $25.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, 1″ Alum. Tubing; 8 — 2′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

S104N • Std. 10m 4-El. (No T), $21.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, ¾″ Alum. Tubing; 8 — 6′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

D64T • DeLuxe 6m 4-El. T match, $28.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, 1″ Alum. Tubing; 8 — 2′ End Inserts, ½″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

S104T • Std. 10m 4-El. T match, $24.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, ¾″ Alum. Tubing; 8 — 6′ End Inserts, ½″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

S102N • Std. 10m 2-El. (No T), $11.95. 1 — 5′ Boom, ¾″ Alum. Tubing; 2 — 6′ Center Elements, ¾″ Alum. Tubing; 4 — 6′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

D104N • DeLuxe 10m 4-El. (No T), $27.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, 1″ Alum. Tubing; 8 — 6′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

S102T • Std. 10m 2-El. T match, $14.95. — 5′ Boom, ¾″ Alum. Tubing; 2 — 6′ Center Elements, ¾″ Alum. Tubing; 4 — 6′ End Inserts, ½″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

D104T • DeLuxe 10m 4-El. T match, $30.95. 1 — 12′ Boom, 1″ Alum. Tubing; 4 — 6′ Center Elements, 1″ Alum. Tubing; 8 — 6′ End Inserts, ½″ Alum. Tubing; 1 — T Match (4′), Polystyrene Tubing; 1 — Beam Mount.

15 M. BEAMS

S152N • Std. 15m 2-El. (No T), $19.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, ¾″ Alum. Tubing; 2 — 5′ End Inserts, ½″ Alum. Tubing; 2 — 7′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

S152T • Std. 15m 2-El. T match, $22.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, ¾″ Alum. Tubing; 2 — 5′ End Inserts, ½″ Alum. Tubing; 2 — 7′ End Inserts, ½″ Alum. Tubing; 1 — T Match (6′), Polystyrene Tubing; 1 — Beam Mount.

D152N • DeLuxe 15m 2-El. (No T), $29.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 2 — 5′ End Inserts, ½″ Alum. Tubing; 2 — 7′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

D152T • DeLuxe 15m 2-El. T match, $32.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 2 — 5′ End Inserts, ½″ Alum. Tubing; 2 — 7′ End Inserts, ½″ Alum. Tubing; 1 — T Match (6′), Polystyrene Tubing; 1 — Beam Mount.

S153N • Std. 15m 3-El. (No. T), $26.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, ¾″ Alum. Tubing; 2 — 5′ End Inserts, ½″ Alum. Tubing; 2 — 6′ End Inserts, ½″ Alum. Tubing; 2 — 7′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

S153T • Std. 15m 3-El. T match, $29.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, ¾″ Alum. Tubing; 2 — 5′ End Inserts, ½″ Alum. Tubing; 2 — 6′ End Inserts, ½″ Alum. Tubing; 2 — 7′ End Inserts, ½″ Alum. Tubing; 1 — T Match (6′), Polystyrene Tubing; 1 — Beam Mount.

D153N • DeLuxe 15m 3-El. (No T), $36.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, 1″ Alum. Tubing; 2 — 5′ End Inserts, ½″ Alum. Tubing; 2 — 6′ End Inserts, ½″ Alum. Tubing; 2 — 7′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

D153T • DeLuxe 15m 3-El. T match, $39.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, 1″ Alum. Tubing; 2 — 5′ End Inserts, ½″ Alum. Tubing; 2 — 6′ End Inserts, ½″ Alum. Tubing; 2 — 7′ End Inserts, ½″ Alum. Tubing; 1 — T Match (6′), Polystyrene Tubing; 1 — Beam Mount.

20 M. BEAMS

S202N • Std. 20m 2-El. (No T), $21.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 4 — 12′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

S202T • Std. 20m 2-El. T match, $24.95. 1 — 12′ Boom, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 4 — 12′ End Inserts, ½″ Alum. Tubing; 1 — T Match (8′), Polystyrene Tubing; 1 — Beam Mount.

D202N • DeLuxe 20m 2-El. (No T), $31.95. 2 — 12′ Booms, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 4 — 12′ End Inserts, ½″ Alum. Tubing; 1 — Beam Crosspiece, 1″ Alum. Tubing; 1 — Beam Mount.

D202T • DeLuxe 20m 2-El. T match, $34.95. 2 — 12′ Booms, 1″ Alum. Tubing; 2 — 12′ Center Elements, 1″ Alum. Tubing; 4 — 12′ End Inserts, ½″ Alum. Tubing; 1 — T Match (8′), Polystyrene Tubing; 1 — Beam Crosspiece, 1″ Alum. Tubing; 1 — Beam Mount.

S203N • Std. 20m 3-El. (No T), $34.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, 1″ Alum. Tubing; 6 — 12′ End Inserts, ½″ Alum. Tubing; 1 — Beam Mount.

S203T • Std. 20m 3-El. T match, $37.95. 1 — 12′ Boom, 1″ Alum. Tubing; 3 — 12′ Center Elements, 1″ Alum. Tubing 6 — 12′ End Inserts, ½″ Alum. Tubing; 1 — T Match (8′), Polystyrene Tubing; 1 — Beam Mount.

D203N • DeLuxe 20m 3-El. (No T), $46.95. 2 — 12′ Booms, 1″ Alum. Tubing; 3 — 12′ Center Elements, 1″ Alum. Tubing; 6 — 12′ End Inserts, ½″ Alum. Tubing; 1 — Beam Crosspiece, 1″ Alum. Tubing; 1 — Beam Mount.

D203T • DeLuxe 20m 3-El. T match, $49.95. 2 — 12′ Booms, 1″ Alum. Tubing; 3 — 12′ Center Elements, 1″ Alum. Tubing; 6 — 12′ End Inserts, ½″ Alum. Tubing; 1 — T Match (8′), Polystyrene Tubing; 1 — Beam Crosspiece, 1″ Alum. Tubing; 1 — Beam Mount.

NEW! VEE-D-X BEAM ROTATOR

Rotates full 365 degree traverse at the flick of your finger. Positive control with no over travel assures that you beam directly in desired direction for maximum signal strength. Tempered, long life gearing, positive mast alignment, easy mounting, guyed at top for extra strength. Rugged and powerful, will support 200 lbs. Decorator designed control console provides instantaneous reversible action, ever-dependable compass indication. Price, $29.95.

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for th: "Drag Races." Operators were SM8, PXP, ZFN, PKR, KMB, WYT, NPB, and NAS. BHF returned home from the hospital to find ZOI had moved his 40-meter gear from the garage to the bedroom, so Bob is convalescing on 40 meters. Traffic: W6GIW 31, OBA 22, MGP 15, TXM 11, NBP 6, KRO 4, JSM 3, OPU 1.

ROANOKE DIVISION

NORTH CAROLINA — SCM, J. C. Geasien, W4DLX — The heat just about killed all activity in July and I don't blame anybody. The Raleigh gang put on a nice picnic with about 100 in attendance. Sorry I missed it. SGD reports she has worked 220 mobiles to date. That's a record of some sort. VHH, of Charlotte, has built an FB new VFO and is working hard on the 4RN this summer. EIV and WDJ, of Charlotte, add two more to the ever-growing list of mobiles in North Carolina. FRH is back on the air from new QTH in Greensboro. In case some of you haven't heard, the Fourth District has now been through the alphabet. You no longer can tell how long a guy has been a ham by the first letter in his call. Two new Novice calls in Charlotte begin with the letter "A." Shades of yesteryear! Reports are slim this month and it's too hot to write so 73 until next month. Traffic: W4VHH 60, DLX 10, SGD 2.

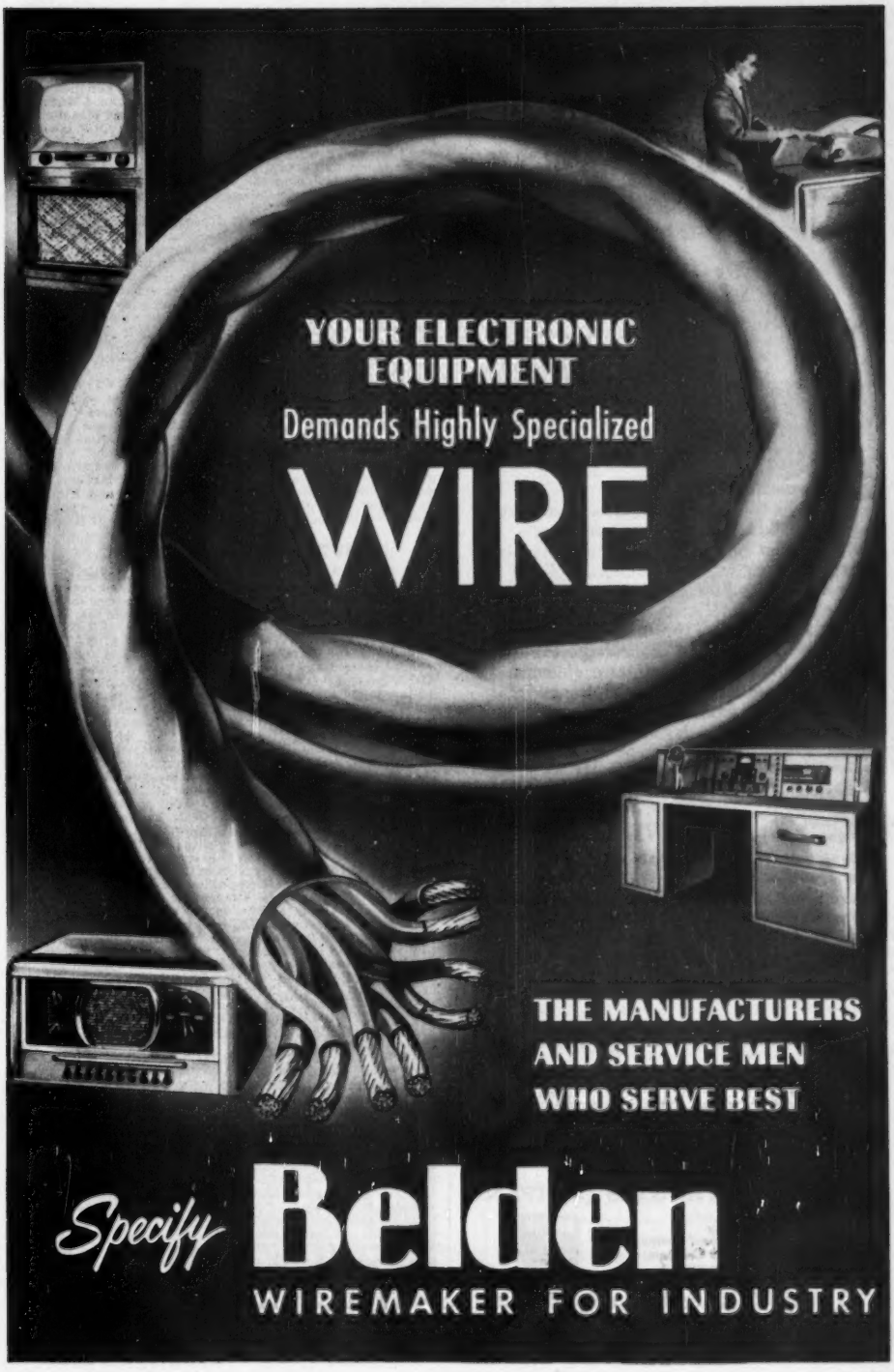
SOUTH CAROLINA — SCM, T. Hunter Wood, W4ANK — UNO, TNG, YQA, NJG, DX, and UFP were among those who attended the hamfest at Augusta, Ga. FM has more voltage than he can use after building "Grammer's Economy Power Supply" from his junk box. DX operated 75-meter mobile during a trip into Tennessee. 2NBL visited in Columbia during July and was active on the South Carolina 'phone net. NTD reports the Rock Hill group had an emergency test on Aug. 2nd. BJE is home in Walterboro after a hitch with the Air Force. BR is building a new rig to include 'phone. The following mobile stations reported into the South Carolina Mobile Roundup on Sunday afternoons during July: ABW, ANK, AUL, BIZ, DX, DXW, LTF, NJG, NTO, NWB, OLZ, SZG, TIS, TPE, TWW, and UPK. The following fixed stations assisted in these tests: ANK, EDQ, NTD, TWW, and ZWF. A mobile/emergency test is planned for every Sunday afternoon between 1430 and 1530 on 3930 kc. using 'phone or c.w. All who have mobile or emergency gear are invited to report during these tests. Fixed stations are requested to guard 3930 kc. during these tests to relay transmissions and to help keep the frequency clear. Experienced operators with medium or high power are needed to help as NCS on the Mobile Roundup. Traffic: W4ANK 111, EDQ 10, UFP 9, FM 6.

VIRGINIA — SCM, H. Edgar Lindauer, W4FF — Virginia stations continue to be heard in abundance during CD Parties. KFC still is plugging along toward that DXCC on 80 meters and reports contact No. 90 with a real rare one, CE9AA on Easter Island. RMs are busily engaged in organizing efforts for the beginning of Virginia's 8th season of postwar activities. The season just passed was the most successful of all and is a challenge for the coming 8th to break that record. W4USN, through the arrangements of LW, editor of *VN*, transmits bulletins of interest to area hams each Friday on 3680 kc. at 2000 hours EST. Items for consideration and weighted value should be forwarded to LW at 414 New Hampshire Ave., Norfolk 8. EMJ has retired from the USAF as a major general and has departed for his home QTH in Kerrville, Tex. He has enrolled in the U. of Texas for postgraduate work. NPT, KSV, KX and KEK, representing Foetulant, Lynchburg, Peninsula and Shenandoah Radio Clubs, participated in Field Day. LPP is planning to use mobile to work VN pals at temporary QTH as field service engineer for USAF. NQV dropped in on the SCM and KFC during his vacation from Princeton prior to the start of his junior year there for a degree in Aeronautical Engineering. RCM got that Amateur Extra Class license, graduated from William and Mary, and entered the Army as a commissioned officer field artillery. VQU/4 passed General Class exam. KRR keeps heavy sked activities with 9RN, TLJ, CAN 3RN, 4RN, RN7, EAN, DON, and 1RN. IPC is active in the Central Amateur Radio Club, Fisherville. K4AF has initiated overseas net Mon. through Sat. on 7025 kc. at 0100 EST. ZNB now is General Class. His QTH is Gottoes. The Harrisonburg Radio Club reports successful Novice extension courses with two General Class grads. This group was organized by MLE. FF has retired from the Office of the Secretary of Defense because of physical disability. Traffic: W4SHJ 201, FV 149, JAU 85, VUY 80, UWS 69, OGX 64, KX 59, LNX 57, NV 49, JAQ 46, RJW 46, GR 23, CFV 17, KFC 16, KRX 14, SLGF/4 12, ZFV 10, FF 9, OWV 9, PYN 9, TYC 9, LK 6, LJE 5, UHG 3, JUJ 2.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Karl Brueggeman, WØCDX — SEC: AEE. Things have been pretty quiet around the State with only a few cards received. ENQ has returned from a 4900-mile trip through the East. His Elmac did a fine job and he reports plenty of mobile contacts. The

(Continued on page 100)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WIREMAKER FOR INDUSTRY

highlight of his trip was getting into Denver on 20 meters to ACA. KHQ made BPL again this month and is thinking about a mobile for the old buggy. NLK has received his General Class ticket. CMO has been in the hospital but is out now and getting along fine. We regret to announce the death of ZEP. John was a sports car enthusiast and died of a heart attack while practicing for a race up Lookout Mountain. IC attended the National Convention at Houston. GCQ has returned from a vacation back East. OBP is rebuilding CDX's old rig for the Denver Radio Club's trailer. The Club also needs a 3-kw. motor generator, so if anyone knows of one that is available, contact WLN or LO. There was not much club news this summer because of vacations, etc., but we hope to receive more this fall. Traffic: WØKHQ 855, KØFAM 323.

UTAH — SCM, Floyd L. Hinshaw, W7UTM — Apparently most of the local amateurs attended the WIMU Hamfest in Idaho as very few remembered to send me news items this month. TVL recently received a QSL card from Australia for a QSO in 1951. Guess they never forget a Utah contact! Salt Lake City Civil Defense will have a new warden training building soon with materials and labor being donated. LQP reports he still has too many outside activities to permit his working on the new rig. OKI is finding a few holes in the 28-Mc. 'phone band. QVO is heard nightly fighting QRM on 40-meter 'phone. Traffic: W7UTM 7.

WYOMING — SCM, Wallace J. Ritter, W7PKX — Interest is picking up on the "Pony Express" Net, with new stations checking in regularly and some Wyoming traffic being handled. The hamfest at Buffalo, Wyo., was a big success with all areas represented and several out-of-State amateurs present. Representation and a talk by WØIC were greatly appreciated. TGZ won the 75-meter transmitter hunt, with ILL taking the 10-meter prize. LHW now is mobile with a hefty signal. JXJ is sporting a new Elmac transmitter. KFV still is doing good on 88. The Cheyenne gang still is having line noise plus TVI. Traffic: W7PKX 92

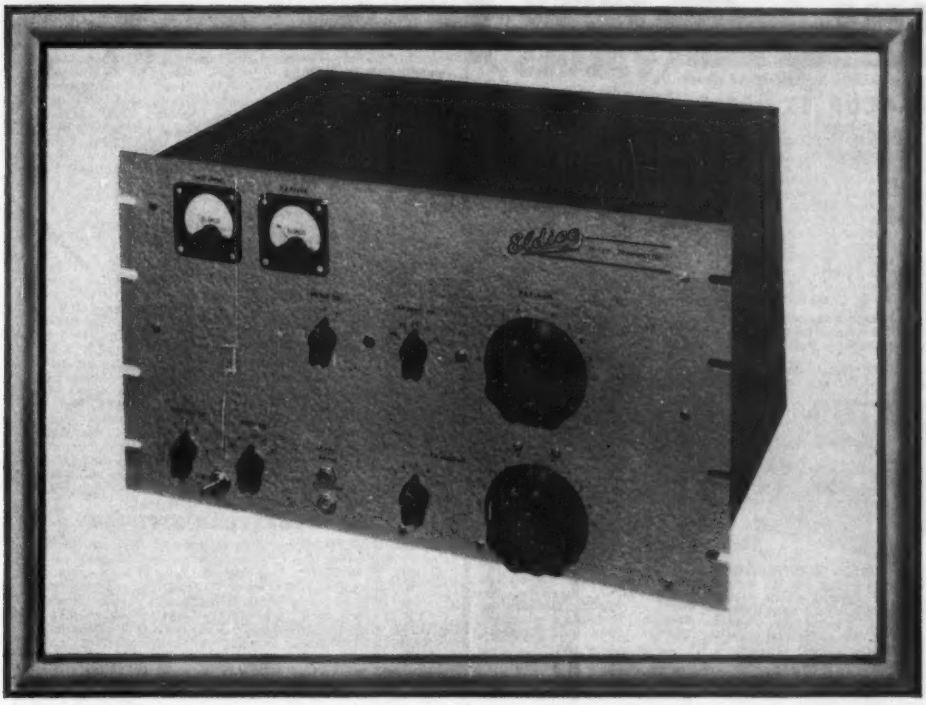
SOUTHEASTERN DIVISION

EASTERN FLORIDA — SCM, John W. Hollister, jr., W4FWZ — The Fifth Gold Coast Marathon between Miami and Palm Beach with ham communications for the first time went over in a terrific way, thanks to MVR, IYT, IM, RWT, SDI, WSJ, RID, VPD, SRZ, PPR, JZB, NJM, MLS, AB, SJK, VGT, LGA, VGV, WLX, ABU, TOJ, DTJ, VYU, and ØMBX/4. Six fixed stations and about 15 mobiles spotted and relayed boat positions. It was a big AREC job and proved the worth of local 28-Mc. nets working into long-haul nets on 3.5 Mc., all 'phone. Another July event was the ham TV show in Miami, thanks to IYT, MVR, LXZ, and JAV. New ECs are DVR in Ocala, DDW in Kissimmee, and NJM at Ft. Lauderdale. AKF is acting for DQA at Orlando. We need an EC in each of the following counties: Baker, Brevard, Citrus, Collier, Columbia, DeSoto, Gilcrest, Glades, Hardee, Hernando, Highlands, Indian River, Levy, Martin, St. Johns, St. Lucie, Sumpter, Union, and Flagler. Please contact FWZ or IM if you are in one of those counties. DVR, at Ocala, has volunteered to handle the 3675-kc. c.w. net (Palmetto Net, call FN), so how about the c.w. gang working with him 100 per cent this season. IYT is handling the Hurricane Net on 7105 kc., with NVU as NCS. HUY is NCS on the 3910-kc. emergency net. KJ says 144-Mc. stations wanting a try at Texas should contact 5YCK for skeds. Bradenton: Welcome back to FKR with his Viking. Dunnellon: We welcome YAB to the traffic gang. Jacksonville: FJC runs the limit with 4–125A. VHR uses p.p. 813s. We welcome WEO to the traffic gang. Key West: ZUS is rebuilding for bigger and better mobile. Leesburg: An auto flip-flop had QBR in the hospital four days. FPC, DRD, and TFP made BPL. Thanks to IM, IYT, KJ, JQ, HUY, VIE and others for the reports. Traffic: W4FPC 663, DRD 199, LDM/KZT 163, PZT 157, TFP 113, ZIR 103, QBR 94, RWM 75, LMT 56, FWZ 20, VIE 18, WGR 15, KJ 12, WEO 12, DVR 10, FKR 10, IYT 6, YAB 5, ZUS 2.

WESTERN FLORIDA — SCM, Edward J. Collins, W4MS/RE — SEC: PLE. AIA is doing an FB job on 75 meters with his 807. YFF, YFG, YFH, and YRF are General Class now. HJA has returned to 75 meters. PTK keeps that FB mobile rig going. TTM keeps the home rig going. 1REV/4 keeps skeds up New England way with his folks. ODO is carrying out experiments with Channel 48 at 55 miles. FHQ keeps his old c.w. skeds on 'phone. BFD finds 20 meters dead late at night. HQ is putting Harvey-Wells in the car for mobile. RZV handles traffic on the Dagwood Net. NOX meets the Hurricane and MARS Nets. UNF was seen buying a new dipole. JPD is enjoying peek-a-boo hex. VR sticks to 40-meter c.w. KG6ADX/4 has gone to Oklahoma and leaves the Viking to his dad, WN4ZPN. MS is awaiting 5527. SSM has been delaying the s.s.b. gear because of the WX. ROM is heard on the 75-meter Fish Net. UCY is having trouble making new antenna load. SZH has moved to 75 meters along with DAO. QU is repairing Navy gear. ART says there is not enough activity on 144 Mc. UYS expects to get on 2 meters this fall. AXF is trying for a WAC. WN5YGG, a YL from Louisiana, is building up a Viking II in Pensy.

(Continued on page 102)

"OPERATION—TVI PROOFED"*



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GEORGIA — SCM, James P. Born, jr., W4ZD — The Camp Gordon Radio Club and the Augusta Radio Club Hamfest, which was held July 26th, was attended by approximately 400 hams, XYLs, and jr. operators. One of the highlights of the Hamfest was the display of mobile Army gear. The Viking II was won by 8LQ. GOR is recovering from an operation. Good luck, Ernie, on a speedy recovery. TO has moved to a new location with plenty of space for an antenna farm; he has two towers up now for his 14- and 21-Mc. beams and is working on the third tower for his 28-Mc. beam. Our sympathies go to LXR, whose mother passed away recently. The new officers of the Carrollton Radio Club are as follows: RJY, pres.; Ray Huggins, 1st vice-pres.; James McKay, 2nd vice-pres.; and WBR, secy.-treas. PBD has moved to North Carolina. VSW has moved to Atlanta from Columbia, S. C., and is active on 3.85-Mc. 'phone. ZRA has a new mobile rig on 3.85-Mc. 'phone. FBH is rebuilding his beam for 14 and 28 Mc. and plans to be active on 144 Mc. soon. N8 is rebuilding and deTVling his rig. WN4AFT is a new ham in Dallas. Emergency Coordinators in this section are reminded of their responsibility to make a full and regular monthly report to the SEC. Only a few ECs have been mailing these reports in. Traffic: (July) W4USA 2344, K4WAR 1844, WBP 79, W4OCG 46, ZD 33, MTS 22. (June) K4WAR 578.

WEST INDIES — SCM, William Werner, KP4DJ. SEC: HZ. Most of the members of the PRARC voted in favor of the new student membership class. KP4PW operated portable from Salinas NG Training Camp. MV now has FB 'phone patch. KE has new BC-610. The PRARC conducted an outing near Manati. GN put up new folded dipole for 3925 kc. Mrs. Maria Luisa Fernández, a long-time famous short-wave listener from Mayaguez, passed the Novice Class examination. Newest in the Novice bands is WP4VH. Strong winds blew down CP's antenna poles. KV4BD and VP2KM report to 3925-kc. AREC Net. RK obtained WPR-100. You need confirmations from 10 Novice stations to get one of the new WPR-N certificates. KD worked CR4AJ and PZ1WX for new 7-Mc. countries and PY6FI for new 3.5-Mc. country and received DXCC-190 sticker. LT now is in San Juan. QA now is on 75-meter 'phone. The 10-meter AREC Net meets every Fri. at 2000. WP4UN now is KP4. Traffic: KP4RK 11.

SOUTHWESTERN DIVISION

LOS ANGELES — SCM, Howard C. Bellman, W6YVJ — SEC: QJW. The PAM appointment is open. RMs: CMN, BHG, GJP. The Section Net, LSN, run by RM BHG, operates on 3650 kc. at 2030 nightly except Sunday, when time shifts to 1000. The Aerojet Radio Amateurs Club is a new ARRL affiliate. Two new OBS are OKD and 5PXW/6, from Louisiana. 5PXW also is OPS and works as NCS in the American Legion Net. Technician/Novice SCR is General Class now and is an Official Observer. Novice-Technician K6BIZ is Onnig Shahan. Flash! Going to press finds 5PXW has a K6 call, BHD. AM sports a QSL from the Sultanate of Oman for an April QSO. JQB is back from touring Idaho, Oregon, and Washington. HLZ received an ARRL Public Service award and has been elected president of the Mission Trail Net. NJU, of the Pacifico Radio Club, is back from a vacation in Mexico. Messages were received from the following Field Day stations: HE, KRH, RW, TSW, PMI, ZVD, IAH, TOI, CV, K6EA, W6GAU, MCK, FNE, ARO, and K6FAJ. The Pacifico RC made WAC and 25 countries in 3 days using 6-wavelength "V" beam. MBA makes BPL. EPL saw a flying saucer July 27th at 10:25 P.M. NCA tells of the Pasadena Boys' Club with a ham station looking for a trustee. LYG claims the Boy Scout Jamboree helped him make BPL. QJW reports the Fish Net is on 3925 kc. evenings and at its annual encampment in the High Sierras brought out these fishermen: RFX, TDW, QVN, VBN, ZNX, JLL, FSE, QJW, PCO, CQV, MDX, EKI, and BPY. QJW was elected Kingfish and got the Champion Liars Award. OMC is mobile, as is K6AZJ. ZSL was appointed RACES Radio Officer as well as EC for the Antelope Valley. MU is raising 40-, 75-, and 2-meter antennas. K6EA, a solid LSN man, has left for a half year in Minnesota. He chalked up over 11,000 points in the CD Party. BHG, RM, reports in 27 total sessions held in July, LSN netted 380 messages. DPL was in W8-Land in August. NCA says YMCA "conflicts" with LSN. BHG received second MTHC award from 7FIX, of *PAN News*. EBK says that RNX has a station on 7-Mc. 'phone. ON gets ground plane for 75 meters. OXR is on 40-meter 'phone, EBK is mobile on 7 Mc., GHJ is on 2 meters, LMT goes c.d. net on 2 meters. WN6ADP thinks he's ready for General Class. AEA, DIV, EBK, ON, and RPP check in on 2 meters with PMJ, RACES Hq. Station. NCO resigned as EC. A ham class will start at the J. Burroughs High School, says CAK. COZ writes CCD/5 likes Air Force life. W6NTN worked 3 days at BSA camp. BUH, ex-9TRA, is 10-meter mobile. Also mobile on 10 meters is KHG and CNP. BLY still is trying to get well. Operators at PMJ are PXA, MAQ, EYN, GUE, WKO, JYP, IHK, VEH, and NGN. Traffic: (July) W6KYV 1557, LYG 478, NTN 474, GYH 426, NLM 299, MBA 270, UGA 187, CAK 106, K6EA 105, W6BHG 90, GJP 74, HLZ 68, COZ 55, DPL 49, LDR 49, CBO 23, CMN 22, NCA 12, HIF 11, OKD 9, AM 6, FMG 4, GEB 4. (June) W6COZ 45.

(Continued on page 104)

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ARIZONA — SCM, Albert Steinbrecher, W7LVR — Asst. SCMs: Kenneth P. Cole, 7QZH; Dr. John A. Stewart, 7SX. SEC: OIF. RM: JGZ. PAM: KOY. A real test of how amateur radio can fill the "breach" when other communications fail, was brought out recently in the Short Creek "Incident." Credit for this fine job goes to the entire Arizona Net, which was highly praised by Gov. Howard Pyle and the press. When the Powder Puff Derby (lady fliers) passed through Arizona, BFA, EAW, IRX, TV KOY, MAE, PJY, REO, and RTE were on hand to handle the communications. New Novice calls are TOH, UBK, UBT, UBZ, UCF, UCI, and UCL. HUV and LVR are now Class 1 Observers. JGZ got his Extra Class license. JT is on 6 meters. TGP is portable in New Mexico. SVO is building all-band with a pair of 813s. SPQ is in the Navy for another 6 months. RTP has a pair of 813s on 15 meters. RTA is building 'phone rig on 75 meters. UAH has moved to Phoenix. ROD is building a kw. transmitter. *Notice:* JGZ is establishing the Arizona C.W. Net on 3515 kc., which will be tied in with TCC nets, etc. Write him direct for further information. *Notice to new licensees:* Please write your SCM giving details on your rig, bands worked, etc. BPL certificates were issued to KOY, PEF, and PMD. Traffic: W7PEF 789, KOY 524, PMD 486, IRX 57, LVR 21, LYS 2.

SAN DIEGO — SCM, Edgar M. Cameron, jr., W6FJH — Asst. SCMs: Thomas H. Wells, 6EWU; Shelley E. Trotter, 6BAM; Richard E. Huddleston, 6DLN. SEC: VFT. Asst. SECs: FOP, WYA. ECs: DEY, ZLV, HRI, QJH. RM: MUE. PAM: JPM. The gang at IAB will be on with s.s.b. soon. The XYL of ZLV presented the OM with a new baby — KN6BHL! The Palomar Club enjoyed the ARRL color film on the Gatti-Hallicrafters Expedition at a recent gathering. Nine-year old KN6AYE, visiting relatives in Southland, also attended the meeting. Are there any younger operators around? Our section loses a good man in SK as an FB SEC. A new SEC, VFT, was appointed at a recent Mobileers breakfast. A terrific M.C. job and XYL show was engineered for breakfast by the XYL of W6PFQ. AREC members gave SK a needed push-to-talk mike stand in appreciation of work done in the past year as SEC. C.d. official Jack Anderson kindly offered a Hammond chord organ for the breakfast, powered by military crank-operated field generator. Evidence was given at the breakfast by HRI, K8I, and QJH that the section is well organized for AREC. QJH has spearheaded the task of lining up AREC quarters at Gillespie Field. TVM reported on the brand-new Convair Club of which he is prexy! QBN has a new sister. The local FCC office held another anti-TVI caucus. MUE is leaving for Colorado. ELQ used emergency power at home during Field Day. W6s QZQ and KEO operated the layout at K6BSA, Boy Scout Jamboree at Irvine Ranch. UJQ is motoring in the East. Recent Novice-to-General Class operators are UJQ, UFE, UKJ, UJO, and UQK. Traffic: (July) W6YDK 357, IZG 116, AKY 38, FCT 27, CHV 4. (June) W6MUE 70, QBN 2.

SANTA BARBARA — SCM, Vincent J. Haggerty, W6IOX — ORI, followed by YCF, led in July traffic. BOZ has a new rig for 80 through 10 meters. The Paso Robles 2-meter net operates on 145.288 Mc. The Paso Robles Club purchased new equipment for its station. OXJ is active on 4 nets. QIW wants more members for SBN on 3600 kc.; an opportunity for new traffic men. DBY, in the Navy, handles traffic on K6NBI. FYW runs 2-meter mobile tests with MSG, LKF, YCZ, and MCR. DLR wants more Santa Barbara, Ventura, and Oxnard stations on the Tri-County Net, 3820 kc., Mon. K6AUZ is a new OES appointee. Traffic: (July) W6ORI 48, YCF 45, OXJ 32, QIW 19, K6NBI 16, W6FYW 5, DLR 2. (June) W6QIW 46, K6NBI 37.

WEST GULF DIVISION

NORTHERN TEXAS — Acting SCM, T. Bruce Craig, W5JQD — SEC: QHI. PAM: IWQ. Election of an SCM for Northern Texas is scheduled for October. Candidates please petition. The Lamesa Club now has a club house. The Plainview Club is officially an ARRL affiliate. GER is away from his home QTH for temporary military training. WN5YYP is Net Control of the Sunday morning Novice Net. The Fort Worth Kilocycle Club has a new bulletin and is sponsoring a blind boy in getting started. The bulletin reports the Club provided communications for a Motorcycle Gypsy Tour. BVG reports he has painted his ham shack. The Big Spring Club reports HQ-129X No. 12777 is missing from the club house. CTM is like a lot of others, seeking information on forming a disaster program where his town does not join in the federal program. KOW renewed his EC appointment and LGY renewed her OBS appointment. This section needs volunteers to fill vacancies in OPS, OBS, ORS, and OO appointments. UBW is jr. operator of IGU. SFW reports a group of v.h.f. operators are busy in West Texas. SZQ is new NCS for West Texas MARS. TYX is his ANCS. CVA is co-chairman of ARC emergency radio communications for the Fort Worth chapter. ECs should send their certificate to QHI for endorsement. Your Acting SCM needs news items; please mail or pass on the air. Traffic: (July) W5TFB 544, PAK 84, UFP 73. (June) W5UFP 177, PAK 156, UBW 93.

(*Continued on page 106*)

OKLAHOMA — SCM, Jesse M. Langford, W5GVV — SEC: AGM. RM: MQI. PAMs: SVR and ROZ. UGO will leave the traffic circles soon for A. & M. MFX is going to Missouri for vacation. AGM is on with an AET-13. MEL has a new MG sport car. ESB, MEN, JCB, and YNF are now on 75-meter mobile. EHC now is using a dynamic mike. VNC reports that this is his last report and he is packing to go to France. Good luck, John. PZW reports traffic for the first time and has gotten rid of his TVI by shielding and by-passes. WN5ZVL is working on 2-meter gear. WEH now is on 75-meter mobile. HCW is a new arrival in Edmond from Texas. Welcome to Oklahoma, Hal. The Lawton-Ft. Sill Club held its annual barbecue on Sept. 13th. OLZ (Okla. C.W. Net) took up operations again Sept. 1st, Mon. through Fri., 1900 to 2000 CST. SCX, OWG, TFP, VHP, TKI, and HZD were among those attending the Convention at Houston. ROZ was on Bride and Groom TV program in New York City. SCX still is doing lots of 2-meter work and looking for schedules. RST left the last of August for California to attend a medical convention. VHP still is in Colorado. PNG is back on with good modulation. LXG is back from vacation in California. EZK is in an Enid Hospital but is feeling better. Traffic: W5UGO 610, GZK 238, MQI 106, PML 30, FEC 26, EHC 22, SVR 19, MFX 18, VNC 17, GVV 16, SWJ 15, AAJ 13, ITF 12, TFP 8, PZW 2.

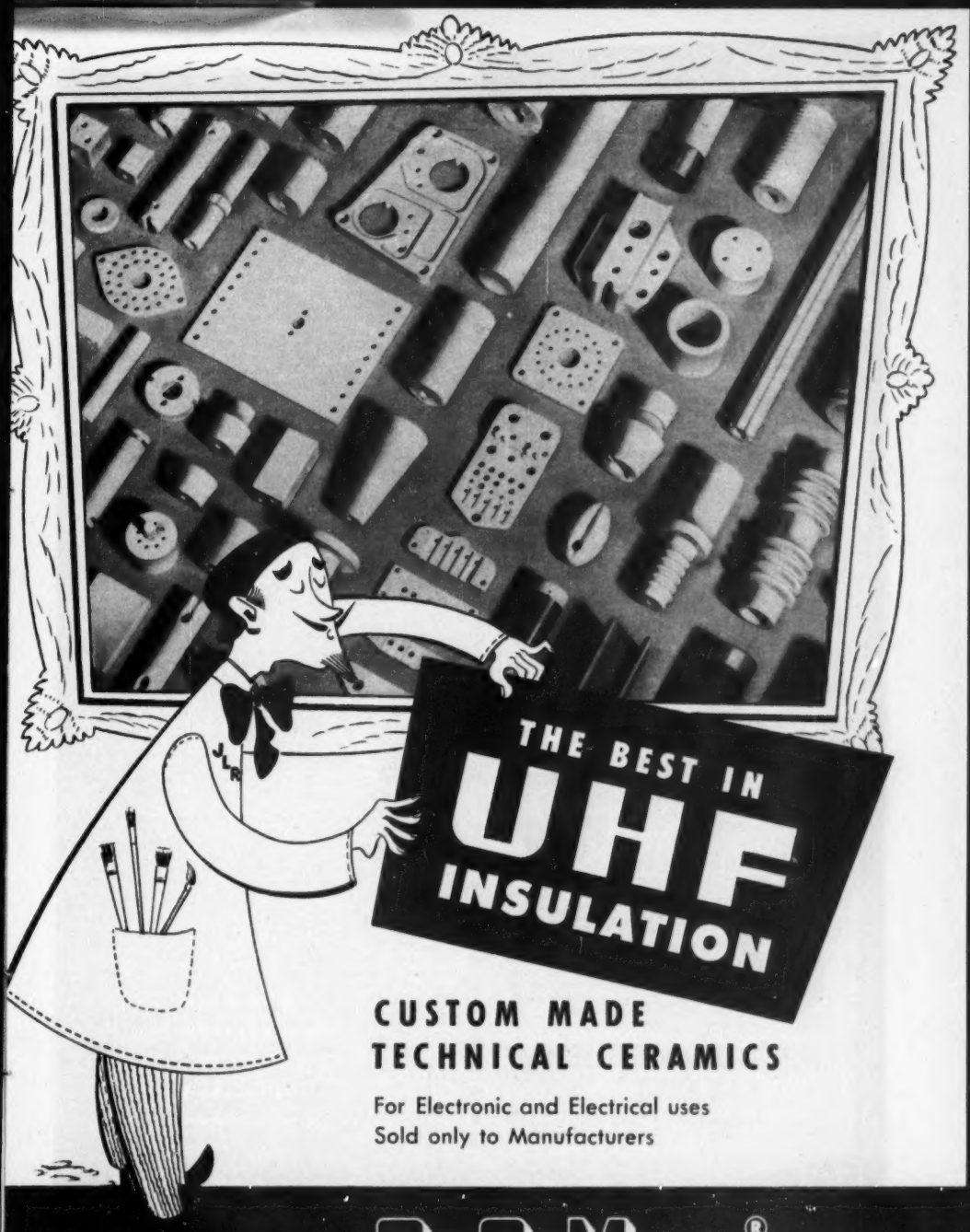
SOUTHERN TEXAS — SCM, Dr. Charles Fermaglich, W5FJF — FJF has recovered from the Convention and has completed his new mobile installation. He has an ART-13, 813 modulated by a pair of 811s with 200 watts input. The trunk is full of equipment but it is worth it. CCT recently demonstrated a one-tube converter to the Port Arthur Radio Club. He has unity on his 75-, 40-, and 20-meter antennas. DFJ also has done some good antenna work. WN5WYZ is working the kinks out of his 40-meter antenna. JUK really is going to town with his DX. CCT and TPD built the 1-tube converters in *QST*. BCF and WPL are working on the same converters using 6BE6. BUZ has a new Globe King. OZY and CFT are active on 3855-kc. mobile. TDN and WYZ have been partying. LQP is active on 20-meter phone. URW worked 32 states with 25 watts on 80-meter c.w. GAW is back in P.A. and is active on all bands. TEH is back on the air. ZCA was active on 40 meters but now is back on 80 because of TVI. Speaking of TVI — the HARC and DARC are producing some motion pictures to combat TVI. You will hear more about this project soon. FJF is chairman of the HARC Committee. BHO has announced that he again will be a candidate for Director. The HARC passed a resolution to support Doc. FJF, who announced on August 7th that West Gulf Division's hams had asked him to be in the running for Director. Doc welcomes letters from the gang. On Emergency Organization he urges your AREC registrations and full coöperation with GLS, the SEC, and his two assistants, ULN (for low frequency) and FEK (for high frequency). SDA monitors 3855 kc. during each day for mobile calls and makes 'phone patches for them. Traffic: W5SDA 157, FJF 32, WN5YSC 1.

NEW MEXICO — SCM, G. Merton Sayre, W5ZU — SEC: MYI. PAM: BIW. RM: NKG. Santa Fe was the mecca for the first state-wide mobile caravan over the week end of July 25-26. The Saturday night meeting was devoted to e.d., AREC, and RACES, with talks by the SCM, the SEC, and the State Director of C.D. On Sunday a simulated emergency test was held from 10:45 to 12:30 with networks on 3838, 4085, and 29,600 kc., with K5NRX, A5RNT, and W5UWA as NCS. About 40 mobiles and 70 licensed hams participated in a successful drill, thanks to the work of the SEC and Santa Fe gang. The caravan proceeded to Will Harrison's home where, with appropriate ceremony, he was invested with honorary membership in all radio clubs in the State and provided with the world's first burro-mobile, thanks to W5IH. Our thanks to N8N for starting the caravan. PLK has a new Elmac A54. CEE and YFN have new Viking IIs. WN5ABO is a new ham in Las Cruces. CEE and BIH assisted the C.A.P. in a simulated search. QDD now is active on RTTY. New appointments: LLG, NUN, and WVA as ECs; 4BRX/5, CEE and MYI as OPS; KWP, MYJ, and MYQ as OES; IGO as OBS; MSG as OO. Traffic: K5WSP 136, W5NKG 43, PLK 32, QDD 26, JZT 18, ZU 18, PXA 15, N8N 13, RWH 11, MYI 9, OIA 7, WVA 6, CEE 3, YFN 2.

CANADIAN DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — SEC: FQ. EC: EK. RM: OM. VO6U is high traffic man this month, nosing out the "northern messenger" by a close margin. The HARC outing and picnic at Bayswater Beach was a big success. LZ and BF and their parties arrived by motor launch. Mobiles present were RW, DQ, FQ, and SI, who contacted AAW, LY, and ET before the latter joined the party. OM reports the MTN will be reactivated during September and JD has been trying the vocal chords on 'phone. Doug says both VO6N and EK were active in the CD Party. Recent visitors to Halifax were K2DBZ, W2AWH, W1RSE, W3BBV, and VP2AJ. Following is VO6 news: VO6N, now at Goose, reports VE1YF flew in

(*Continued on page 108*)



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recently and while visiting VO6U his plane took off and left him. VO6AP has left Goose after a year's tour of duty. W4AVM, VO6 is back at Goose as a civilian and is going single sideband. VO6B is traveling a lot and is VO6/MM working the home station while away on duty. VO6T also is going single sideband. VO6U, on ORS and president of GBRC, says the GBRC meets in Doug's shack. WØWNI/VO6 piled up 643 'phone patches during the month of June with an unofficial total of 337 messages. VO6AD, ex-VO2G, has a Harvey-Wells TBS-50. PT is on motor trip to VE3-Land. TA recently returned from a visit to U. S. A. Traffic: VO6U 246, VE1FQ 242, VE1AAW 147, VE1ZM 50, VE1UT 26, VO6N 25, VO6K 17, VO6L 13, VO6AD 10, VO6R 10, VE1LY 7.

ONTARIO — SCM, G. Eric Farquhar, VE3IA — With vacations over for another year, activity seems to be on the upswing, both experimentally and traffic-wise. The Toronto 10-Meter Net, operating on 28,250 kc., started its fall session on Sept. 13th. AUU, BHK, and DRD are now Class A license holders. AVS has been busy trailer-building. EAB spent part of his vacation at Jackson, Mich., and insists he managed to keep outside the big wall. BQP has two very impressive 50-foot telescoping masts. DLS completed conversion of an ATR-8. Fine signals are heard from DLS, DQX, and DPQ. YR, while mobiling up Ottawa way, reported into the net and handled traffic for Bytown. Through the grapevine we learn that ham radio was successfully used in getting word to a person in a remote part of this section of a death in the family. Nice work, fellows, and a tip of the hat to mobile work. No information has been received direct on the Ontario 'Phone Club picnic held at Collingwood, but by eavesdropping we learn it was well attended and the affair very successful. CI now sports a Viking. NI and UJ enjoyed mobile vacations. Traffic: (July) VE3ATR 248, NG 75, IA 65, EAM 20, AUU 7, BSU 6, AVS 4, VZ 4, SG 2, DNE 1. (June) VE3DNE 3.

QUEBEC — SCM, Gordon A. Lynn, VE2GL — BK, AX, GK, BR, FK, and CJ are all active from summer places at Dunany and Lake Louisa each running ten to fifty watts, except GK, who has only four watts. FK has a nice-sounding mobile on 75 meters which he built himself, including the receiver. BR's 9-watt mobile puts a good signal into Westmount Mountain on c.d. frequency 29,640 kc., a distance of 50–60 miles. GN, who changed QTH to Quebec City (Sillery) some time ago, now is active on 3.8 and 14 Mc. with 300 watts VFO to 4–125A final using a 342 receiver. UM has the bugs out of the rig on 20 meters, is enjoying QSOs on that band and now in planning higher power using 813. ATE, ATO, and ATX are newcomers in the St. Maurice Valley region, and are active on 75-meter c.w. EC continues to maintain skeds twice daily with AGO, AEM, and AON. AON is manager of a nice net on 75-meter 'phone daily at 6:30 P.M. AAO again took part in the Frequency Measuring Tests on May 22nd with an average accuracy of 88.2 parts per million. DR has been taking part in OSN daily at 7 P.M. and finds more activity there. NZ is using center-loaded whip for his mobile. Traffic: VE2EC 28, DR 11, UM 6, GL 3.

ALBERTA — SCM, Sydney T. Jones, VE6MJ — WC reports that activity on the Maple Leaf Net is slowing up because of no VE4 contact in Winnipeg. How about it, VE4s? EA has new T2FD antenna working. EH has gone to work on some v.h.f. equipment. HM is away on a trip to Eastern Canada. MJ vacationed in the old home town of Vernon and renewed acquaintances. EY vacationed in Vancouver and had a good "look-see" at television. AT finally is going mobile with the addition of a Gonset converter in the Austin. GW is frequently heard from the local drive-in. LQ, HM, ZR, DZ, and MJ did very well in the latest Frequency Measuring Test. ZR is kept busy these days making several trips to the North Country. EW returned to Edmonton on vacation. OK was a recent visitor to Edmonton. Reports have been very small during the past few months, gang. Your SCM is unable to write this column without your help. Traffic: VE6HM 117, OD 48, WC 16, MJ 4.

BRITISH COLUMBIA — SCM, Peter McIntyre, VE7JT — At the time of this writing everyone is migrating for holidays. BF has been touring and filling the deep-freeze with the results of a fishing trip in the interior. QZ and family have invaded Vancouver for a time. AKD and DD will have had their trip to W6-Land and be happy and broke. Our Island correspondent reports: ALL has built a new mobile around a new car, US has a new mobile and new antenna, ASA now is building power supply, APL reported as the DX hound of the Island, SH still gets excited on making a contact, SG moved QTH but still is on the air. DH is satisfied now, I hope, not in file No. 99. ACC went into the frozen North for the summer and ALY is poking an FB signal from Parkesville. BJ, NCS of the 5 O'clock Net, reports that VE7s AAZ, ACM, CB, KB, II, AW, ME, UF, and NQ are the regular check-ins, KB is taking a vacation to Scotland. Had two good personal QSOs with W6YME and WØAJU, who were mobiling in Vancouver. The section was saddened at the passing of AMI, G. P. Reeves, Fairmont Hot Springs. Would still like to have more news to report if *you* will send it. If you don't let us know what goes nobody else knows. So *please* drop us a line. Traffic: VE7QC 58, DH 12.

Simulated Emergency Test

(*Continued from page 53*)

relaying or delivering other types of traffic. ANRC in Washington will have a special telephone operator on duty to receive incoming messages which arrive through other channels. W1AW and many other Connecticut amateurs will be monitoring the National Calling and Emergency frequencies (especially 3550, 3875, 7100, and 7250 kc.) and Connecticut Net frequencies (3640 and 3880 kc.) to handle traffic to ARRL and to assist as necessary in relaying other traffic. Virginia Net frequencies (for D. C. traffic) are 3680 and 3835 kc. Maryland-Delaware-D. C. section net frequency is 3650.

National Calling and Emergency Frequencies are to be used *for calling only*. Once contact has been established traffic should be handled elsewhere. The coöperation of all amateurs has been solicited to keep these frequencies clear for this purpose on the October 3rd–4th week end.

Nets of the National Traffic System will remain in extraordinary session during the SET to assist as and if needed. *You* be there, too! You will want to be a part of this nation-wide demonstration of amateur radio's preparedness to handle emergency communications, both locally and nationally. *See you October 3rd–4th!*

220-Mc. Station

(*Continued from page 16*)

either way, depending on how closely the size of L_3 duplicates the original. When you have a fairly weak signal tuned in you may be able to make some improvement in the reception by adjusting the spacing of the turns in the mixer grid coil and the amount of oscillator injection for best results.

Just what you will hear will depend on the amount of activity on 220 Mc. in your area. You can probably find out about this by talking with other local amateurs. If you are the first one on the band in your locality you may need a beam antenna and some patience before you hear any signals. Information is published in the v.h.f. section of *QST* regarding the operating schedules of 220-Mc. stations from time to time.

While this receiver won't equal a low-noise converter in pulling in distant stations, it will do surprisingly well, considering its simplicity and low cost. Lab checks show that a modulated signal of one microvolt is audible, and a 10-microvolt signal almost completely quiets the receiver hiss. Any signal that is a substantial margin over the noise on the best receiver should be readable on this one. Control of regeneration is smooth and the stability is good enough so that a readable c.w. beat note can be heard if the regeneration is set just at the point where the hiss stops. The best setting of the control will depend on the type of signal to be received, and some practice will be needed to develop proficiency in tuning in weak signals.

The receiver is designed to give good results with a minimum of cost and complication. Its circuitry and layout are such that it could be revamped into a converter at a later date, if one wishes to do this, or it could be torn down and most of the parts salvaged for a more advanced project. In the meantime, however, the builder will have a smooth-working receiver, and he will have gained experience in construction and adjustment that will stand him in good stead.

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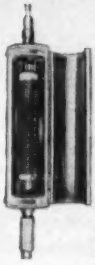

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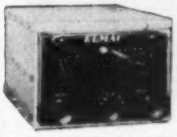

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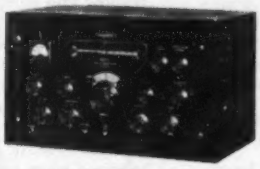

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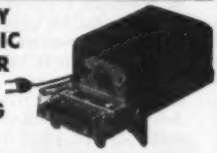

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TVI Demonstration

(*Continued from page 17*)

the receiver, and how simple methods, such as high-pass filters, will fix up much of the interference that is caused by lack of front-end selectivity.

Amateur TVI is covered, of course, but in its proper perspective — that is, as one (usually relatively minor) type among many. We don't believe that in this day and age a ham has to be convinced that harmonic TVI can be cured. But if you think this means that the demonstration is of secondary interest to hams, you're wrong — at least in the opinion of the many hams who've seen it so far!

— *G. G.*

Desk-Top Driver-Amplifier

(*Continued from page 27*)

output jack. Turn on the plate voltage and observe the meter — little or no current should be flowing in the 815 tube. Now press the key down. If place current flows, the final tank should be quickly resonated as indicated by a dip in plate current. If no current flows, try retuning the driver tank. After the final is tuned, switch the meter to read grid current. Tune the driver tank until the amplifier grid current is 1.25 ma. The TVI filter and the antenna may now be connected. If the antenna is fed with a tuned line, an antenna coupler will be required between the filter and the line. The coupling should be adjusted until the cathode current is about 85 ma. *Note:* The full-scale meter reading is 250 ma. when reading cathode current and 10 ma. when reading grid current.

To operate on 14 Mc., turn the bandswitch to the 14-Mc. position and allow the other heater in the 815 to reach operating temperature. Now repeat the adjustments outlined above, noting that the grid current may be 2.5 ma. and the loaded cathode current about 170 ma. A slight readjustment of the driver tuning condenser is required when switching from 7 to 14 Mc.

Before operating the transmitter on the air, a listening test with a well-shielded receiver should be made to determine that the note is clean and sharp and that no spurious signals are being radiated. Failure to pass this test may indicate the presence of parasitic oscillations. In some cases, a parasitic trap in the 815 screen grid circuit, or tuning of the plate traps, may be required.

This transmitter has been operated in an apartment house without causing TVI in any of the neighbors' receivers. The family upstairs had their receiver — using a rabbit-ears antenna — located directly over the operating position and not more than 16 feet distant. The author's own receiver required a high-pass TVI filter to prevent blanketing since the transmitting antenna runs parallel to the TV receiver antenna and they are less than two feet apart.

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Keying

(Continued from page 30)

out to suit other r.f. tube line-ups. This basic circuit has been used at W1DX to key a 2E26 driver and the screen of a 4-250A à la W6BET. In this case, the cathode-follower stage was two 1625s (cheaper in surplus than 807s) in parallel, and the positive source voltage for the cathode follower was around +700 for an operating value of 500. The plate resistor of the 6J5 must be increased if a higher source voltage is used.

Naturally, we like this keying system, or we wouldn't bother to pass it along. Unless you have a punk VFO that is pulled by keying a later stage, it will give you chirpless keying that can be made as firm or soft as you desire. The break-in operation is equivalent to keying the oscillator, or so close to it that you don't know the difference.

If you give the circuit a try, leave some room on the chassis for an audio transformer and a switch, if you have any desire to try a.m. ("ancient modulation"). By switching out C_1 (Fig. 4), switching the audio-transformer secondary in where the 2400-ohm resistor is, and setting the 10,000-ohm potentiometer to about half its normal setting, there appears to be no good reason why you shouldn't have a screen-modulated 'phone rig. Unfortunately, s.s.b. can't be applied quite as easily!

Pi-Network Final

(Continued from page 37)

parasitics in a 50-Mc. pi-network amplifier are discussed in *QST*[6] and the *Handbook*.[7]

The writer has always been partial to having grid and plate meters an integral part of an amplifier, as is done here. While some apprehension was felt as to the possibility of radiation through the meters, this has not proven to be the case.

In conclusion, a word of caution. In handling this unit, we adopted a rule at the outset: *never adjust L_2 with the plate voltage on*, no matter how little. This is a precaution which may be unnecessary, but we felt that, if we never adjusted the inductor with any plate voltage, we would not be apt to forget and some day adjust it with the full voltage on with possible damaging results.

In summary, it can be said that this amplifier adequately fulfills the writer's desires and as near as can be determined, short of actual efficiency tests, the efficiency of the unit appears to be the same at 50 Mc. as it does at 3.5 Mc. At 500 watts input, the tube shows no color on any frequency, and the components — including the variable inductor — do their job in a most commendable manner.

[6] Tilton, "A High-Powered Amplifier for 50, 28 and 21 Mc.," *QST*, Dec., 1952, p. 14.

[7] *The Radio Amateur's Handbook*, 30th edition, chap. 17, p. 398.

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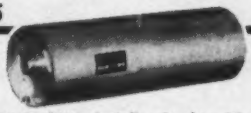

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Suppressing TVI

(*Continued from page 83*)

self-tapping metal screws. Additional holes are needed in the cover plate for the coax-jack, the power-lead and control connections. These should be no larger than necessary.

When the back cover plate is mounted in place, another test for TVI should be made, as these measures alone may prove to be enough for many areas.

Sealing the Cabinet

If the foregoing isn't sufficient, the next step is sealing the lid and the contact between the cabinet and the panel. The paint should be removed from the under side around the edge of the lid, as well as from the lip around the top of the cabinet where the lid rests. Since there is no lip along the hinge side of the opening, one must be provided to seal off the cracks along the hinge. This is made by fastening a one-inch-wide strip of metal on the inside of the cabinet along the rear of the cover opening, so that half its width is exposed, producing a lip flush with the others. Paint should be removed where the strip makes contact with the cabinet and with the cover. The lid should be fastened down tightly with several self-tapping screws along all four edges.[1] The unit should then be removed while the paint is cleaned from the lips around the panel opening in the cabinet.

Hot Spots

Checks at this point still showed interference on some channels with a weak TV signal. However, TVI was down enough so that a probe could now be attached to the antenna terminals of the TV set and the Shifter carefully gone over to find the weak points in the shielding. With the TV set and the Shifter side by side, a single-wire lead was attached to one of the antenna terminals on the TV set. The other end of the wire was then touched to various parts of the Shifter and the effects were immediately apparent on the TV set.

The a.c. power leads were "hot" with interference as also were the shafts of the bandswitch and tuning control on the front of the panel. In addition, there appeared to be considerable harmonic radiation from the top of the cabinet, directly over the 807. The Shifter was then removed from the cabinet and tests were made with the probe to see which leads were the worst offenders. It was evident that the plate lead of the 807, and the filament leads to the 807 and 6V6 were the "hottest" points in the unit. The filament wire from the back of the Shifter to the 807 and 6V6 was replaced with shielded wire. Three 0.001-μf. disk-ceramic condensers were installed to by-pass the filament lead[2] — one at the rear terminal block, one at

(*Continued on page 118*)

[1] Electronic weatherstripping might be beneficial here. See Schreiber, "Is Your Rig R.F.-Tight?," *QST*, Aug., 1953.

[2] *The Radio Amateur's Handbook* chapter on BCI and TVI.

NEWARK'S Page of Values!

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.2 Mfd. 5000 VDC. Sprague oil-filled unit. Ceramic terminals, 10/32" Stud. Size, 3⅜x3¾x1¾". Wt., 2 lbs.
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Mallory Type NF-1-2 Noise Filter. For filtering generator hash. Will handle either 6 or 12 VDC at 50 amps. Formerly used on 32 volt aircraft systems. Easily mounted on car generator. Wt., ½ lb.
54G502. 10 for 5.00.....**Each 69c**

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54G581. 10 for 12.00.....**Each 1.50**

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54G203	2 mfd. 2000 volts	1.75
54G204	1 mfd. 1500 volts	1.25
54G205	.5 mfd. 2000 volts	.89
54G206	2 mfd. 2500 volts	2.10
54G207	1 mfd. 3000 volts	3.50
54G208	2 mfd. 4000 volts	6.95
54G209	.5 mfd. 3000 volts	1.25
54G210	1 mfd. 6000 volts	8.95

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the 807 socket and one at the 6V6 socket. This eliminated harmonic radiation from the filament circuit.

A shield can large enough to cover the 807 and its plate lead was made from an ordinary tin can. To insure good ventilation, both ends of the can were removed and then the top of the can was covered with copper screening. Several holes were drilled around the bottom edge of the can to allow air to flow through.

Radiation from the two control shafts mentioned was eliminated by installing a panel bearing on each.

When all the steps described in this article were completed, the Signal Shifter was completely clean on all TV channels, regardless of the output frequency of the unit. Different models of the Signal Shifter may present other problems. The Model 9–1090 described in this article, and the later Model "EX," are similar, so they probably could be treated alike. The work involved in cleaning up one of these units can be completed in one evening, so the time spent would certainly be worth the effort.

'DQW Antenna

(Continued from page 59)

steering post. The thermocouple is in the RG-8/U line near the antenna change-over relay.

In tuning the antenna, after the transmitter is moved to the desired spot, the antenna control is turned to right or left, as the case may be, until the antenna current peaks. At this point the loading of the single 807 should reach the proper value and the antenna is in tune, with maximum efficiency.

This method need not be confined to 75 meters as the same device would tune any band using a loading coil. The mechanism is waterproof and packed in magneto grease and the operation is very smooth and easy regardless of the lay-back of the antenna. The drawing is not intended to be too specific in detail, but rather to show just how it operates. Neither does the coil form need to be made of wood. A new one of polystyrene is in the making in our shop, mainly for better appearance. A coat of gray hammertone sprayed on the antenna makes the appearance acceptable. We also find that a layer of Scotch tape wound on the loading coil from bottom to top keeps out the rain without changing the frequency.

World Above 50 Mc.

(Continued from page 67)

ing morning, when Paul finally quit for some much-needed sleep. W4UDQ (Mrs. W4HHK) heard signs of W2UK for some time after this. The night of the 11th was predicted to be the time of maximum activity in the annual Perseid meteor shower, and meteor scattering seemed to be above normal after midnight, reaching a peak around 0730 on the 12th, when one of W4HHK's calls was answered by W2UK, with Paul logging his reply and "F FB . . ." and then the signal trailed off into the noise.

(Continued on page 120)

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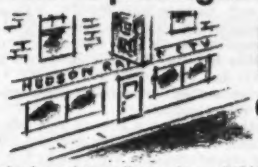

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A try for a new 220-Mc. record was made that night by W8WJC/BFQ. They worked W5RCI on 144 Mc., and managed to get through to him on 220 Mc., but no two-way contact was made over this haul of close to 700 miles.

W8BFQ is finding the morning hours a fine time for v.h.f. work as conditions are almost invariably better than at night. Her regular morning schedules with W2QED have produced signals on 420 Mc. anytime anything was doing on 144, and she is now also doing morning business on 144, 220 and 420 Mc. to the west. Cross-band contacts with W9EQC, Aurora, Ill., with Margaret on 220 and Dick on 144 have been carried on duplex, and W9OVL, Hammond, Ind., is worked two-way on 220. The first Illinois-Ohio 420-Mc. contact was made on July 31st between W8BFQ and W9QXP, Glen Ellyn, Ill., a distance of nearly 350 miles.

The 420-Mc. r.f. amplifier described in August *QST* has been duplicated with excellent results, according to several reports. W1RFU has found that he is able to copy voice signals with his 6AJ4 preamplifier that are completely inaudible with the coaxial-line crystal mixer alone. Bill now finds that his reception on 420 is running better than on 144, where he uses a band-switching converter with a pentode front end. Another Bill, W3VIR, Willow Grove, Pa., is enthusiastic over his results with the 6AJ4. These two now work regularly on 435 Mc., with signal levels usually better than they have on 144. The distance is about 200 miles. W2QED has been copied on 435 Mc. by W1RFU (240 miles) on several occasions recently when his 144-Mc. signal was inaudible.

Another tube that is proving very effective in 420-Mc. r.f. amplifier work is the Sylvania 6AN4. This tube has quite similar characteristics to the 6AJ4 by GE, but its base is a 7-pin miniature. W5AYU, Houston, Texas, showed the gang at the National Convention some beautiful 420-Mc. gear using the 6AN4. Lee reports that noise generator checks with a single 6AN4 grounded-grid r.f. stage followed by a 1N21B crystal mixer and low-noise i.f. amplifier showed a 6-db. noise figure for this system. Adding two more outboard stages with 6AN4s gave the same noise figure, so nothing was gained in these extra stages that could not have been accomplished more readily at the intermediate frequency.

Similar checks were made with converters using triode mixers, and it was found that the two stages of r.f. were needed to overcome the mixer noise. A BC-645 checked was so bad that no trace of noise could be heard with the 645 alone, and adding the two-stage preamplifier brought the noise figure down to only 9.3 db., indicating that three stages would be required to make much out of the 645. And, of course, it still would have that tremendous bandwidth to keep it from being an effective 420-Mc. receiver.

Note for 220- and 420-Mc. enthusiasts of the Northeast: W1WAS, South Portland, Maine, transmits nightly on 221.2 Mc. between 7 and 8 P.M., and at other times when conditions look good. Similar transmissions will be running on 435.5 Mc. before this appears in print. Tone modulation is used on both rigs. Vince would appreciate your sending him a card reporting details if you pick him up on either of these frequencies.

Silent Keys

It is with deep regret that we record the passing of these amateurs:

W1ZK, Mark L. MacAdam, Brockton, Mass.
W3KQQ, Warren S. Allem, jr., Oreland, Penna.
W3ZS, John H. Stenger, jr., Shavertown, Penna.
W4CZA, Vivian E. Howell, Moultrieville, S. C.
W4KVK, Samuel C. Kennedy, Somerset, Ky.
W5OKM, Curtis W. Davis, Waco, Texas
W5QVW, Lee W. Smith, Oklahoma City, Okla.
W5SLK, John W. Watterson, McAlester, Okla.
W6IBR, Capt. Walter N. Hunter, USAF
ex-W6OJ, Maj. Clyde DeVinna, USMCR, Hollywood, Calif.
W7ERH, Kenneth R. Rice, Colfax, Wash.
W7MTI, William B. Hutcheson, Colfax, Wash.
W9GYI, Albert A. Johnson, Park Forest, Ill.
WØDVV, Edwin D. Smith, Merriam, Kans.

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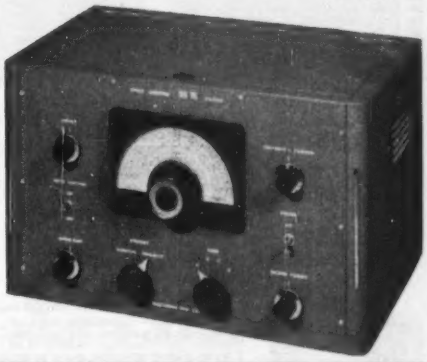

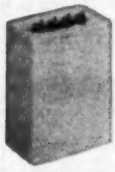

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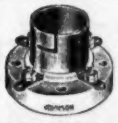

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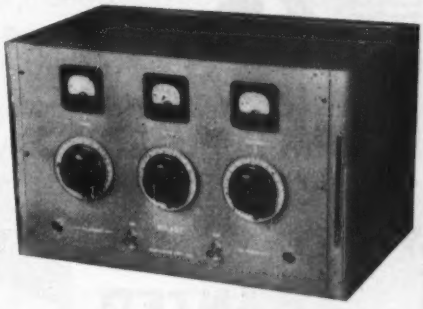

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(Continued from page 60)

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ST2AR.....1242- 9- 46-A- -

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KT1UX.....17,072- 22-259-B-33
CN2AS.....850- 10- 29-A- 3

Union of South Africa

ZS5MP.....17,920- 28-214-A- -
ZS6BJ.....369- 9- 14-A- -
ZS5LA.....118- 2- 29-A- -

ASIA

Japan

JA3AB.....6875- 13-125-A-25
JA3AF.....4790- 10-166-A-26
KA2HQ.....2984- 8-125-B-15
JA3AA.....1500- 6- 93-C-22
KA9AA.....1406- 8- 59-A- -
KA2LG?.....1368- 6- 76-B- -
JA2AI.....1052- 4- 89-A- -
JA1BC.....312- 4- 26-A- 4
JA1AB.....243- 3- 27-A-11
JA1BN.....45- 3- 5-A- 3
KA8AB (KA8LB).....2480- 10- 80-C- -

Lebanon

OD5XX.....625- 7- 31-A- 4

Turkey

TA3AA.....23,610- 30-263-B-18

EUROPE

Austria

OE13RN.....8910- 16-165-B-29
OE13HL.....4130- 14- 99-B-11

Azores

CT2BO.....11,880- 27-150-A-11

Belgium

ON4TQ.....7696- 16-161-A-28
ON4RT.....5096- 13-131-A- -
ON4PA.....1032- 8- 43-A- -

Czechoslovakia

OK1MB.....13,675- 25-176-C- -

Denmark

OZ1W.....25,430- 30-297-A-58

Eire

EI5C.....38,456- 23-565-A-48
EI5G.....2486- 11- 79-B-11
EI5F.....1625- 11- 60-A- -
EI9J.....1056- 8- 45-B- 3

England

G5RI.....59,297- 43-460-B-43
G6GN.....35,112- 38-314-B-60
G2HOF.....2268- 12- 64-B-12
G2DPT.....45- 3- 5-A- -

Finland

OH2VZ.....1970- 10- 67-A- -
OH2MQ.....1144- 11- 36-A-10
OH3RA.....693- 9- 28-A- -
OH5OU.....198- 6- 11-A- 6
OH2SD.....180- 5- 12-A- -

France

F8V.....33,033- 33-335-A-33
F8QP.....11,400- 25-152-A- -
F8RM.....9513- 21-151-A- -
8TQ.....5214- 22- 79-A- -
F8PM.....3978- 13-102-A- -
F8GB.....576- 9- 22-A- 5
F8BB.....72- 3- 8-A- -

Germany

DL4EF.....27,944- 28-335-B-36
DL1DX.....20,160- 27-249-B-30
DL1FF.....16,878- 29-198-B-41
DL1BR.....15,900- 25-190-A- -
DL1KD.....7938- 27- 98-B- -
DL4TX.....6272- 14-156-B-33
DL6GB.....3876- 19- 68-A- -
DL1HH.....1635- 15- 37-B-21
DL4DF.....176- 6- 10-A-

Iceland

TF3AB.....12,306- 17-242-A- -
TF3MB.....9612- 18-182-A- -
TF2SG.....5104- 16-108-A- -

Italy

I1ALU.....16,416- 24-228-A-25
I1ER.....462- 7- 22-A-18

Netherlands

PA0EP.....24,288- 32-257-A-82
PA0VB.....21,111- 31-227-B-34
PA0GN.....19,032- 28-244-A-60
PA0KW.....11,115- 16-193-A-30
PA0SPR.....4860- 15-108-A-21
PA0TAU.....4425- 18- 82-A- -
PA0WAC.....3234- 14- 77-A- 8
PA0ZL.....632- 8- 18-A-13
PA0FW.....170- 5- 12-A-12
PA0LY.....115- 5- 8-A- 2

Norway

LA6U.....5530- 14-137-A-15
LA3HA.....3146- 13- 82-A- -
LA7Z.....918- 9- 34-A- 7
LA4KD.....510- 10- 17-A- 6
LA4K.....294- 7- 14-A- -
LA1TC.....85- 5- 6-A-10

Portugal

CT1DJ.....40,246- 34-473-B- -
CT1TY.....5550- 14-125-A-20

Saarland

9S4AX.....8664- 21-131-A-40
9S4AL.....940- 10- 32-A- 5

Scotland

GM2FHH.....8664- 19-156-B-24
GM8MJ.....6384- 14-152-A-20
GM3DPL.....1431- 9- 53-B- -

Spain

EA4CN.....91,828- 44-701-A- -
EA3AB.....71,226- 38-629-A-38
EA8CY.....3822- 14- 91-A- 8
EA3GF.....2431- 11- 78-B-12

Sweden

SM3ARE.....2952- 12- 82-B- -
SM4ACO.....2736- 12- 77-B-16
SM6DA.....2573- 11- 69-B- -
SM5AQV.....1377- 9- 51-B- -
SM7AKG.....1045- 11- 32-A- 8
SM7AVA.....1012- 11- 31-A- -
SM7XV.....980- 10- 33-B- -
SM5BQJ.....975- 15- 22-B- -
SM5XX.....525- 7- 25-B- -
SM6BUD.....480- 8- 20-A- -
SM6APB.....350- 7- 18-B- -
SM6AOU.....192- 6- 11-B- 3
SM7AOO.....18- 2- 3-A- -
SM2RF.....18- 2- 3-B- -
SM5UU.....6- 1- 2-B- 1
SM5CO.....3- 1- 1-B- -

Switzerland

HB9MU.....5600- 14-125-A-23
HB9MX.....3996- 18- 76-B- 1
HB9AT.....2652- 13- 68-A- 9
HB9CI.....2158- 13- 58-A- 7

Wales

GW3ZV.....51,816- 23-610-B-48

Yugoslavia

YU1AG.....5400- 18-100-A- -

NORTH AMERICA

Alaska

KL7WC.....27,300-28- 325-B-30
KL7APH.....1250- 9- 86-A-37

Bahamas

VP7NM.....86,448-68 -632-A-

Barbados

VP6AF.....5544-12- 154-A-14

Bermuda

VP9BF.....296,944-67-1479-A-80
VP9BDA (VP9s BC BD BG BI BJ D L X) 289,440-63-1455-B-90

Canal Zone

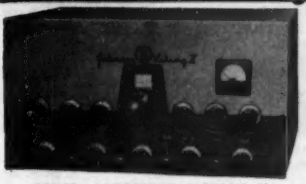
KZ5RS.....199,913-71- 937-A-51

Cayman Is.

VP5BH.....27,864-27- 344-A-26

(Continued on page 124)

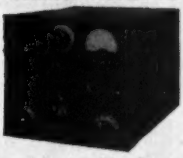
Lafayette for High Voltage BARGAINS!



NEW! JOHNSON VIKING II

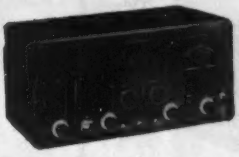
The Johnson Viking II transmitter kit incorporates all the desirable features of its predecessor plus those required for effective TVI suppression. 100 watts output on phone and 130 watts on CW on all bands 160 thru 10 meters. New final amplifier uses parallel 6146 tubes. All parts supplied, including copper plated steel cabinet, chassis, wiring harness, all hardware and tubes. Complete construction test and operation manual also supplied. Viking II Transmitter Kit.....279.50

JOHNSON MOBILE TRANSMITTER KIT



New Johnson mobile transmitter kit, a band-switching 4 band rig. 60 watts input, 100% modulated (30 watts on 300 volt supply) 807 final, microphone input — dynamic, crystal or carbon. Crystal or VFO control. Viking Mobile Transmitter Kit (less tubes) 99.50

LAFAYETTE — HEADQUARTERS FOR COMMUNICATIONS RECEIVERS



Lafayette has been the Headquarters for fine communications receivers for 32 years. All the latest models are available as soon as released by the manufacturers. Be sure to check Lafayette before you buy your new receiver.

HALLICRAFTERS		NATIONAL	
S-38C	49.50	SW 54	49.95
S-40B	119.95	NC 125T	179.95
S-53A	89.95	NC 183D	369.50
SX-62	299.50	HRO 60	483.50
SX-71	224.50	HAMMERLUND	
SX-73	975.00	HQ-140	264.00
S-76	179.50		

RME MC-55 5-BAND MOBILE CONVERTER

MC-55 Net $69.50
MC-53, for 2, 6 and 10-11 Meters..... 66.60
MC-57, for 10, 20 and 75 Meters..... 64.50

STOCK NO. HFS-10

$59.50 for Tuner alone! Reg. $82.50

The famous Espey 512 AM-FM tuner. Guaranteed 100% by Espey and Lafayette. The 512 is a self-powered tuner with built-in preamp, 2 high gain I.F. stages and an R.F. stage for both FM and AM circuits. Equipped with loop antenna for standard broadcast and folded dipole for FM. External phono input — 2 audio output channels — all controlled by the tuner volume control. Tubes: (2) 6BA6, (2) 6BE6, 6SH7, 6SG7, 6AL5, 6C4, 6SQ7, 6U5, 5Y3GT rect. 13½" W x 8½" H x 9" D. Wt. 18 lbs.
ESPEY 512 AM-FM TUNER NET 59.50

The Audio "Buy" of the Year!

HERE IS WHAT YOU GET!

Espey 512C FM-AM Tuner
Bell 2122B 10 Watt Amplifier
Webcor 3-Speed Changer with . . .
GE RPX-050 Triple Play Cartridge
GE 12" PM S12010 Speaker

actual TOTAL price ~~$193.30~~

COMBINATION INCLUDING TUNER:

Our SMASH Price $149.95

NOW! Compact TAPE RECORDER that has Everything!

$84.50 . . . at a price that's almost nothing!

Equal in quality and reproduction to the larger and MORE expensive recorders — but MUCH smaller, lighter. Dual track recording. Fast forward and rewind — full 7" reel rewinds in 80 seconds. Frequency response essentially flat from 70 to 8500 c.p.s. at 7½ IPS and from 90 to 6000 c.p.s. at 3¾ IPS. Wow and flutter less than ½ of 1%. Handles up to 7" reels. Two hours recording time on one 7" reel at 3¾ IPS using standard tape. 3 watt amplifier. Inputs — mike and radio-phono. Outputs — 8.2 ohm for speaker plus high impedance for external amplifier. Controls — one operating control for record and play and one control each for tone and volume. Size — 8¾" x 10¾" x 11⅛". Wt. only 29 lbs., complete. 110-120 volts, 60 cycles A.C. Complete with microphone, reel of tape and extra reel. Choice of 2 models: Model 903 — 3¾ IPS; Model 907 — 7½ IPS. Aqua and beige leatherette case.

Lafayette Radio

FAMOUS IN RADIO FOR 32 YEARS

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NEWARK, N. J.	24 Central Ave.
PLAINFIELD, N. J.	139 West 2nd St.
BOSTON, MASS	110 Federal St.

Costa Rica

TI2TG.....148,224-52- 908-B-32

Cuba

CO2BM.....56,700-30- 631-A- -
CM7PT.....5148-13- 132-A- -

Greenland

OX3UD.....6480-15- 144-A- -

Guantanamo Bay

KG4AF.....545,292-81-2244-C-47

Mexico

XE2OK.....147,539-49-1011-B-43
XE1PJ.....5706-12- 161-A- 6

Nicaragua

YN1AA.....66,395-55- 403-A-18

Puerto Rico

KP4JE.....200,202-61-1094-B-42
KP4CC.....133,200-49- 915-B-44
KP4UB.....102,344- 44- 780-B-34
W4DFY/KP4.....66,144-52- 424-A-32
W4RCB/KP4.....18,055-23- 285-B-35

Virgin Islands

KV4AA.....341,510-71-1688-C-52
KV4AQ.....291,629-67-1505-C-60

OCEANIA

Australia

VK2GW.....45,535-35- 435-A-51
VK2ADE.....29,860-28- 249-A- -
VK3XK.....20,097-27- 247-A-17
VK3AHH.....8925-25- 119-A-26
VK3XB.....5250-14- 126-A-18
VK3ANJ.....3672-17- 73-A-30
VK5JE.....2706-11- 82-A- -
VK5PO.....924-11- 28-A- 2
VK5LC.....144- 3- 16-A- -
VK2HZ.....84- 4- 7-A- -
VK7RT.....24- 2- 4-A- -

Canton Is.

KB6AY.....58,053-37- 523-B-26

Hawaii

KH6MG.....339,552-72-1574-C-70
KH6IJ.....223,788-68-1097-C-51
KH6PM.....200,064-64-1042-B-53
KH6ER.....141,798-49- 904-C-53
KH6BW.....4832-18- 76-B-11
KH6ANK.....2717-19- 48-A-35

Marianas Is.

KG6FAA.....24,120-24- 335-B- 9

New Zealand

ZL3OA.....92,267-49- 633-A- -
ZL1MQ.....54,264-51- 355-A-30
ZL2GS.....38,232-36- 355-A-00
ZL3GQ.....32,682-30- 282-A- -
ZL1HT.....6168-28- 97-A- 6
ZL2MM.....4452-14- 108-A- -

Wake Island

KW6BI.....14,722-17- 289-B-26

SOUTH AMERICA

Argentina

LU1EP.....117,044-58- 683-C-33
LU8AE.....84,105-45- 629-B-17
LU9AX.....54,604-44- 417-B- -
LU2GB.....15,960-24- 133-A- -

Bolivia

CP1BX.....12,630-20- 211-A-11

Brazil

PY4IE.....101,405-53- 642-B-54
PY2OE.....71,064-42- 564-B-38
PY1ADA.....58,338-42- 463-B-28
PY4AJD.....34,104-42- 275-B-25
PY3QX.....24,128-29- 280-A-27
PY4DU.....9570-29- 112-B- -
PY8AK.....4200-20- 73-C- -
PY4ABN.....525- 7- 25-A- -

Chile

CE3AG.....215,280-69-1040-C-46
CE8AB.....23,636-38- 210-B- -
CE1BD.....1287-13- 33-A- 8

Netherlands West Indies

PJ2AA.....62,976-41- 512-B-23
PJ2CB.....28,128-32- 293-A-11
PJ2AJ.....56- 4- 5-A- 1

Peru

OA4N.....60,759-43- 477-B-25

Uruguay

CX7AC.....4746-14- 113-C- -
CX6AD.....2252-13- 62-A- -
CX1FB.....84- 4- 7-A- 1

Venezuela

YV5DE.....92,906-47- 661-A-52
YV5FH.....37,758-42- 301-B- 7
YV5BJ.....60- 3- 7-C- -

[1] W4PNK, opr.
[2] W3BES, opr.
[3] Hq. staff, not eligible for award.
[4] W6BII, opr.
[5] W3GRF, opr.
[6] W6LHN, opr.
[7] W8SZU, opr.

'PHONE SCORES

ATLANTIC DIVISION

E. Pennsylvania

W3DHM.....136,890-123-371-C-70
W3GHS.....72,518-101-248-B-48
W3KT.....50,922- 69-246-C-56
W3CTJ.....38,340- 71-100-C-26
W3NA.....34,560- 69-167-C-40
W3IMV.....29,535- 65-153-B-30
W3EQA.....24,522- 61-134-C-57
W3HFD.....18,984- 54-100-C-20
W3ALB.....17,013- 53-107-C-24
W3CUB.....13,440- 48- 95-C-23
W3DLR.....12,831- 47- 91-C-29
W3OJE.....6144- 32- 64-B-18
W3DPS.....4536- 27- 56-B-12
W3PQB.....1656- 23- 24-B- 7
W3JBC.....969- 17- 19-C- -
W3QLW.....969- 17- 19-B-10
W3CH3H.....330- 10- 11-B- -
W3GHD.....312- 8- 13-B- 5
W3EAN.....144- 6- 8-C- 3
W3LVF (W3s EKK ISE KDF)
186,570-110-329-C-60
W3CGS (W3GHD)
17,004- 52-109-C-36

Md.-Del.-D.C.

W3MSK.....124,254-117-356-C-60
W3DRD.....7560- 42- 60-B-30
W3GR.....6384- 36- 56-B-25
W3JTC.....2112- 22- 32-C-10
W3EQK.....1040- 22- 20-B-11
W3EIS.....420- 11- 13-B- 5
W3WV.....75- 5- 5-B- -
W3ZQ (W3VES
29,409- 67-143-B-44

So. New Jersey

W2SAI[1].....171,235-115-498-C-80

W. New York

W2FBA.....13,674- 53- 86-C-20
W2UTH.....1944- 24- 27-B- 8
W2TXB.....855- 15- 19-C-11
W2MA.....504- 12- 14-C- -
W2ICE.....494- 13- 14-C- -
W2FZO (W2BEO)...5404- 28- 65-C-16

W. Pennsylvania

W3LXE.....23,058- 61-126-C-27
W3AER.....588- 14- 14-B- 5
W3VKD.....6- 1- 2-C- 1
W3NCP*.....3- 1- 1-A- -

CENTRAL DIVISION

Illinois

W9NDA.....53,133- 88-199-C-50
W9NH.....6732- 44- 51-B-43
K9FAJ[2].....2484- 27- 31-B-34
W9ARA.....108- 6- 6-C- 1
W9PKW (W9s GVZ NZM)
45,684- 83-192-C-84

Indiana

W9JRP.....11,718- 42- 93-B-58
W9ECQ.....437- 19- 23-B- -

Wisconsin

W9EWC.....79,905-105-254-C-73

(*Continued on page 126*)

SAVE UP TO 50% during GIGANTIC CLEARANCE SALE of USED TEST and COMMUNICATION EQUIPMENT

Our entire stock of reconditioned, "good-as-new" equipment must go at a record-breaking sacrifice. Each and every instrument guaranteed to meet manufacturer's original tolerance when shipped to you. All bands and functions on receivers and all ranges on test equipment have been carefully checked. While this is only a partial list of our huge inventory (available at the time this publication goes to press) bargains like these simply can't last! So act now and avoid disappointment. Wire, write, phone or use the handy coupon today! When ordering indicate first, second and third choice. All merchandise subject to prior sale.

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Collins 75A2 Receiver with spkr.	349.50
Eldico TR75TV Wired but AS IS	27.50
Gonset 10 meter Converter	12.50
Hallicrafter HT9 Transmitter	184.50
Hallicrafter HT17 Transmitter	27.50
Hallicrafter HT18 VFO	79.50
Hallicrafter S20R Recvr.	39.50
Hallicrafter SX25 Recvr. less spkr.	79.50
Hallicrafter S38 Recvr.	29.50
Hallicrafter S40 Recvr.	49.50
Hallicrafter S40A Recvr.	59.50
Hallicrafter S40B Recvr.	69.50
Hallicrafter SX42 Recvr. less spkr.	149.50
Hallicrafter SX43 Recvr. less spkr.	99.50
Hallicrafter S47 FM-AM-Shortwave recvr.	47.50
Hallicrafter S53A Recvr.	52.50
Hallicrafter SX62 Recvr. less spkr.	179.50
Hallicrafter S72 Portable Recvr.	59.50
Hallicrafter S72L Portable Recvr.	52.50
Hallicrafter S77 Recvr.	69.50
Hammarlund HQ129X Recvr. with spkr.	139.00
Harvey Wells TBS50 Transmitter	59.50
Harvey Wells TBS50C Transmitter	69.50
Harvey Wells TBS50D Transmitter	84.50
Harvey Wells APS50 Power Supply	24.50
Johnson Viking I—Wired and tested	199.50
Lysco 600 Transmitter	99.50
Lysco 600S Transmitter	139.50
Meck T60 Transmitter	69.50
Meissner EX Signal Shifter—Wired	39.50
Meissner FMX	5.00
Meissner 9-1008 Signal Booster	19.50
Meissner 9-1090 Signal Shifter	49.50
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Millen 92101 R'9er with tube & 1 coil	12.50
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National HFS Recvr. with P. S.	110.00
National NC57 Recvr.	59.50
National NC125 Recvr. with spkr.	134.50
National NC183 Recvr. with spkr.	199.50
RME HF10-20 Convertor	49.50
RME DB22A Preselector	37.50
RME 50 Receiver with spkr.	124.50
RME VHF152 Converter	37.50
RME VHF152A Convertor	42.50
Simpson 380 Wavemeter	19.50
Sonar MR3 Mobile Recvr. less P. S.	49.50
Sonar MB611—NBFM Mobile Transmitter	14.50
Sonar VFX 680 NBFM Exciter	19.50
Surplus BC221 Freq. Meter with Xtal & Book	59.50
Sylvania X7018 Modulation Meter	19.50
Telvar T60-2 Transmitter	74.50

TEST EQUIPMENT

TUBE TESTERS

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Superior 450	22.50

VOM'S

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Simpson 260	27.50
Superior 670	19.95
Supreme 542	12.50
Triplett 666H	14.95
Weston 772	36.50

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Hickok 305 5"	89.50
Precision ES500 5"	99.50
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W9EZD.....8240- 44- 70-B-23
W9FDX.....3960- 30- 52-B-15
W9OMZ.....924- 22- 23-B- 8
W9BVZ.....561- 11- 17-C- -
W9HMG.....390- 10- 13-B- -
W9GIL.....84- 4- 7-B- -
W9GWK.....12- 2- 2-B- 2
W9HHX (W7MMI, WØCEO)
5390- 35- 52-C-35

DAKOTA DIVISION

No. Dakota

WØBPO.....36- 3- 4-A- 5

So. Dakota

WØPRZ.....51,750- 90-191-C-50
WØNGM.....5670- 35- 54-C- -

Minnesota

WØWIP.....4794- 34- 47-B-13

DELTA DIVISION

Louisiana

W5JUF.....57,302-101-190-B-70

Tennessee

W4DQH.....90,882- 99-301-C-65
W4FKA.....4032- 32- 42-B-20

GREAT LAKES DIVISION

Kentucky

W4KZF.....5772- 37- 52-B-16
W4OMW.....108- 6- 6-B- -

Michigan

W8YQD.....28,272- 62-152-C-30
W8NGO (W8CLR)
62,775- 93-225-C- -
W8DUS (W8s RAE UPN)
28,187- 72-133-C-60

Ohio

W8NXF.....56,742- 90-195-B-57
W8ACE.....12,144- 46- 88-C-18
W8AJW.....10,731- 49- 74-A- -
W8JIN.....3441- 31- 37-C- 5
W8BF.....330- 10- 11-C- 2
W8PM.....32- 4- 4-B- 2
W8JGU.....12- 2- 2-B- 1

HUDSON DIVISION

E. New York

W2ANB.....175- 7- 11-B- 3
W2BTV.....3- 1- 1-C- -

N. Y. C.-L. I.

W2SKE.....113,918-103-372-C-70
W2WZ.....67,284- 84-247-C-75
W2BRV.....6612- 38- 58-B- -
W2GSN.....4956- 28- 59-B- -
W2BWC.....1701- 21- 27-B- 8

No. New Jersey

W2ATE.....4224- 32- 44-B-14
W2EQS.....27- 3- 3-B- 2
K2BCK.....12- 2- 2-B- 3

MIDWEST DIVISION

Iowa

WØNWX.....108- 6- 6-A-

Missouri

WØGEK[6].....2210- 17- 44-B-18
WØFLN (WØGNG, WØs AJE ETW)
27- 3- 3-B- 4

Nebraska

WØBBS.....10,293- 47- 73-C-28

NEW ENGLAND DIVISION

Connecticut

W1ATE.....189,114-129-498-C- -
W1ODW.....3393- 29- 39-B-27
W1MRJ.....2205- 21- 35-B-14
W1QFQ.....1575- 21- 25-B-15

Maine

W1MCW.....55,429- 68-275-B-53

E. Massachusetts

W1PST.....5084- 31- 55-C-20
W1MKW.....408- 8- 17-B-14

(*Continued on page 128*)

W. Massachusetts

W1ZD.....37,252- 67-186-C-41

New Hampshire

W1BFT.....39,240- 63-160-A- -

NORTHWESTERN DIVISION

Oregon

W7HIA.....33,600- 64-175-C-60
W7LNG.....894- 12- 23-B-20
W7GWE.....3- 1- 1-B- 1

Washington

W7DL.....25,200- 60-140-C- -
W7HAD.....9297- 33- 93-C-35
W7PQE.....6216- 28- 76-C-31

PACIFIC DIVISION

Santa Clara Valley

W6YX[3].....45,150- 70-215-C-42
W6ZZ.....12- 2- 2-B-

East Bay

W6VVZ.....58,824- 76-258-C- -
W6PTH.....47,628- 77-209-C-40
W6LDD.....9560- 34- 84-C-30
W6GIZ.....4848- 16-101-C-18
W6EJA.....810- 9- 25-A- 7
W6KEK.....195- 5- 13-B-

San Francisco

W6WB.....15,424- 42-124-C- -
W6ATO.....3366- 22- 51-C-20
W6GPB.....1008- 12- 28-B-14

San Joaquin Valley

W6MEL.....27,144- 52-174-C-45

ROANOKE DIVISION

North Carolina

W4GXB.....11,352- 44- 86-C- 9
W4CEN.....2484- 23- 36-B- 6
W4KE.....540- 13- 14-C- 4

Virginia

W4ESK.....198,720-139-480-C-80
W4KWY.....93,318-103-302-C- -
W4NTZ/4.....83,904- 92-304-C- -
W4OM.....57,510- 90-213-C- -
W4LIM.....5436- 36- 51-B- -
W3GRF/4.....4620- 28- 55-C- -
W4CC.....108- 6- 6-A- 4
W4WAB.....75- 5- 5-B-

West Virginia

W8PQQ.....22,311- 67-111-C-44

ROCKY MOUNTAIN DIVISION

Colorado

WØNWW.....2106- 18- 39-B-

Utah

W7QDJ.....2- 1- 1-A-

SOUTHEASTERN DIVISION

Alabama

W4HA.....8640- 40- 72-C-20
W4TKL.....240- 8- 10-B- -

E. Florida

W4EED.....1071- 17- 21-B- 8
W4TRA.....816- 12- 23-B- 8

W. Florida

W4AGB.....10,224- 48- 71-B-

Georgia

K4WAR[4].....4056- 26- 52-C-17
W4SCU.....858- 13- 22-A-11

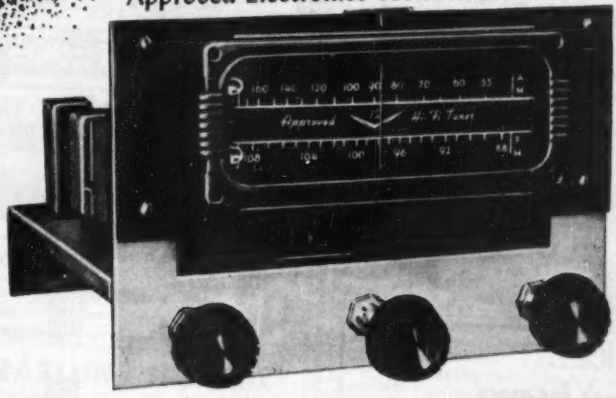
SOUTHWESTERN DIVISION

Los Angeles

W6BJU.....10,101- 37- 91-C-27
W6CYI.....9234- 38- 81-C-30
W6NJU.....147- 7- 7-A-18
W6GEB.....132- 4- 11-C- 3
W6LTV[5].....3- 1- 1-B-
W6YRA (W6s BHN ERN HOH)
1170- 13- 30-B-10

OVER 50% OFF! NEW 12-TUBE HIGH-FIDELITY FM-AM TUNER BUILT TO SELL FOR $85.00

Approved Electronics 1954 Model "V-12"



Reg. Net Price $85

TRUE DISCRIMINATOR DOUBLE-LIMITER HIGH-FIDELITY FM!

$41.95

ORDER 36-206 QS.

AN EXCLUSIVE RADIO SHACK 'SCOOP'!

When Approved's chief engineer showed us the prototype of this fine company's 1954 Model V-12, we contracted to buy the ENTIRE year's supply — the biggest *special purchase* of tuners EVER made by a single company. First, because V-12 is *vastly superior* to the previous Model A-710. Secondly, to eliminate middleman profits and save our many friends some REAL money. If you ordered an Approved A-710 from us and found, to your sorrow, we are sold out: NOW is the time to act. If you are considering buying a hi-fi tuner: NOW is the time to buy a *reputable product* from the East's best-known mail order company at savings NOBODY IN THE WORLD can duplicate!

SPECIFICATIONS: 12 miniature tubes plus 1N34 germanium diode 2nd det. AM. Two limiters, FM detector. Tuned RF stage on *both* AM and FM. Separate RF and IF stages on AM and FM. Rugged 6-gang variable, FM section copper plates. Improved sensitivity and AVC on AM. *Guaranteed 15 uv.* for 20 db quieting on FM. Dual AM-FM band-indicating lamps. Controls: power, tuning, bandswitch; no volume control to upset output impedance or frequency response. *Cathode follower output,* 30-15,000 cps. All top quality components. Standard RMA guarantee. *Ultra compact:* 8¼" W x 5¾" H x 8" D., ship. wt. 7 lbs. Notice: requires 6.3V AC @ 4 amps, 190V DC @ 55 ma power supply.

POWER SUPPLY $12.05 110-115V 50-60 cy., delivers 6.3V AC @ 4 amps, 190V DC @ 55 ma. Size 3½x4½x8". Ship. wt. 7 lbs. Approved —built to match V-12 tuner.
Order No. 36-207QS.

RADIO SHACK
167 Washington St., Boston 8, Mass.

Arizona

W7PZ	1680	28-	25-B-20
W7ENA	9	3-	3-A- 2

San Diego

W6CHV	9057	37-	87-B-35
W6CTP	6090	35-	58-C-14
W6CAE	2384	24-	47-C-10

WEST GULF DIVISION

Northern Texas

W5BGP	78,586	99-	270-B-54
W5DJH	34,383	73-	157-B-62

Oklahoma

W5ALB	4140	23-	60-B-10

Southern Texas

W5KBP	19,320	60-	108-C-48
W5DML	48	4-	4-C- 1

New Mexico

W5LGS	5396	25-	52-B-23

CANADIAN DIVISION

Maritime

VE1PQ	10,146	39-	89-B-42
VE1CM	7854	34-	79-B-30
VO6N	6830	30-	67-A- -
VE1CU	2231	23-	33-A-15
VE1YT	1584	16-	33-A-13
VO6U	672	14-	16-A- 6
VE1EK	550	10-	19-A-11
K1FBH/VO2	270	9-	10-B- -
VO1D	27	3-	3-A- 1

Quebec

VE2AHE	11,480	38-	100-B-22
VE2HZ	3150	27-	39-B-24
VE2WA	2880	24-	39-B- 9

Ontario

VE3KF	50,358	77-	218-C-35
VE3HJ	336	8-	14-B- 2

Manitoba

VE4RO	40,375	85-	177-C-55
VE4RP	390	10-	13-B-25

Saskatchewan

VE5GF	378	9-	14-B- 8

British Columbia

VE7YQ	26,730	66-	135-C-41
VE7ZM	897	13-	23-B- 7

AFRICA

Algeria

FA3JY	432	6-	24-A- -

Angola

CR6AI (CR6CM)	5852	14-	142-A-12

Madeira Is.

CT3AN	891	9-	33-A- 3

Union of South Africa

ZS6DW	27,480	40-	229-A-

ASIA

Japan

KA2IM[3]	4446	13-	114-C-11
JA1AD	240	5-	16-A- 3
KA2LG[3]	153	3-	17-C- -
KA8AB (WØQDC)	2340	10-	78-C- -

Turkey

TA3AA	7540	18-	140-B-25

EUROPE

Belgium

ON4RT	504	9-	19-A- -

Denmark

OZ7PH	4095	13-	106-A-16
OZ9R	3468	17-	68-C- -
OZ1W	12	2-	2-A- 1
OZ3EA (OZ6BC)	5418	18-	103-A-28

Eire

EI3Y	4256	17-	126-B-35

England

G2PU	24,708	29-	284-B-22
G3DO	5456	16-	72-B- 8
G3COJ	3200	25-	44-B- -

France

F8RM	5580	18-	102-A- -
F9NL	2145	13-	55-A-22
F8ZO	1296	12-	36-A- -

Germany

DL4AY	1536	8-	64-B-10
DL4OV[7]	1440	12-	40-B- -
DL4LU	1320	11-	40-B-16

Italy

I1BDV	8200	20-	155-A- -
I1IRL	8436	18-	157-A-18

Netherlands

PA0BRG	4528	16-	95-A-23

Norway

LA4KD	150	6-	9-A- 3

Poland

SP9KKA	168	6-	10-A-

Portugal

CT1CL	59,422	37-	543-A- -
CT1QF	21,204	36-	201-B-21
CT1SQ	11,388	28-	147-B-22
CT1CD	5250	15-	73-A- -
CT1ER	936	13-	24-A- -
CT1BS (CT1BW)	68,921	41-	549-A- -

Spain

EA4DB	22,113	27-	278-A-30
EA4CT	1056	10-	55-A- 8
EA4CK	120	4-	10-A- -

Sweden

SM5FA	6230	15-	96-B-18
SM7VH	711	9-	22-A- -

Switzerland

HB9MX	6634	23-	99-B- 1

Trieste

I1CGU (I1BLF)	720	8-	31-A- 9

NORTH AMERICA

Alaska

KL7AON	42,150	39-	305-B-35

(Continued on page 130)

VE3ZW didn't use that microphone in the contest, but his c.w. score of 119,196 was tops for Canada.

Uncle Dave's Radio Shack

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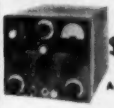

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Amateur Net

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(In Stock)

Kit, complete with tubes—less crystal, key and mike.

Wired and Tested, $334.50

ELDICO TR-75-TV TRANSMITTER KIT

The ideal novice transmitter. New TVI circuit. Uses 6L6 as oscillator and 807 amplifier to PI Network output.

$64.95

MOBILE TRANSMITTER KIT STANCOR ST203A

$31.75

WIRED AND TESTED
$43.00

72 Ohm KW Transmission Line, 9c per ft.; $5 per 100 ft.

USED EQUIPMENT — Send for Demonstrator and Used List

Collins 32V-3 Transmitter

$775

VFO Controlled, Bandswitching, Gangtuned. Covers 80, 40, 20, 15, 11 and 10 meters; 150 watts CW; 120 watts phone; entire RF section enclosed in metal shield. (In Stock)

COLLINS 75A-3 RECEIVER
With Mechanical Filter and Speaker

$550

HAMMARLUND HQ 140X

$264.50

Matching Speaker
$14.50

Tunes .54-31 mc. in six bands; calibrated band spread; 9 tubes in RF and AF; full wave rectifier and voltage regulator; calibrated S meter; crystal filter; antenna compensation; AVC; new series-type noise limiter; furnished in two-tone gray.

USED EQUIPMENT

RME DB22A		$ 45.00
National NC240	With Speaker and Select-a-Just	200.00
National NC100	With Speaker	95.00
Hallicrafter SX43	With Speaker (2 Only)	150.00
Hallicrafter HT9 Transmitter	Grey, with Complete Coils	200.00
Meissner 150B Transmitter	Complete	250.00
Eldico TR75TV	Wired and Tested	70.00
Sonar VFX 680		60.00
Meisner Exciter Units		25.00
Lysco 175T		19.50
National HRO5TA1	With Speaker and Coils	115.00
Hallicrafter SX25	With Speaker	115.00
National HFS	With Power Supply (Like New)	135.00
Automatic Key	(Molotlin)	5.00
Harvey Wells DPS50 Power Supply	(Regular $89.50)	45.00
Sonar MR3 Receiver		50.00
Gonset 2 Meter Converter		30.00
Sonar FM Exciter	With 40 and 20-Meter Coils	100.00
Sonar 10 Meter MB611		50.00
Aircraft Transceiver		25.00

Trade-ins TOP ALLOWANCE

DISPLAY MODELS — DEMONSTRATORS
NEW GUARANTEE

Sonar SR9 Two-Meter Receiver		$ 57.50
Sonar MB-26 Two-Meter Transmitter		57.50
Harvey Wells TBS50D		119.95
Hallicrafter S-76 Receiver		149.95
Harvey Wells APS50 Power Supply		34.50
Hallicrafter S-77	(AC-DC Version of S-40B)	99.00
Hallicrafter S-40B		109.00
Gonset Marine Converter		33.95

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TUBES — standard brands
6AK5 ..... 47c ea. — 6 for $2.50
6C4 ..... 39c ea. — 6 for 2.00
6AQ5 ..... 39c ea. — 6 for 2.00
12AT7 ..... 39c ea. — 6 for 2.00

MINIATURE VARIABLE CONDENSERS
Screw driver adjustment.
25 mmfd. ....25c ea.—5 for $1.00
140 mmfd. ....75c ea.—4 for 2.50

FEED THRU INSULATOR, ceramic.
For 1" hole, 41c ea.—10 for $3.25
For 1½" hole, 45c ea.—10 for 3.50

INSULATOR, cone type
1¼" high, 18c ea. — 10 for $1.50
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STANDOFF INSULATORS, low loss steatite, nickel plated base and top.
Dia. ½" x 1⅛" high — 13c ea.
10 for $1.50
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10 for $1.45
Dia. ¾" x 4½" high — 43c ea.
10 for $3.20
Dia. ¾" x 6½" high — 59c ea.
10 for $4.75

SOCKET, 7 pin min., mica filled, shield base .....10 for $1.00

SWITCH, phenolic section, 2 deck, 3 pole, 3 pos., NS., 29c ea.
4 for $1.00

FOREIGN TRADE SOLICITED

Extra Special
DYNAMOTOR CN45B
6V in, 400 V 160 MA out. Complete with conversion diagram and brackets. Will go Forest Fast.
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KL7WC.....1296- 12- 36-B- 3

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VP6SD.....155,935- 65-805-C-72

Bermuda

VP9BDA (VP9: AU AV AX BA BC BD BE BG D G L).....178,974- 61-1009-B-96

Costa Rica

TI3LA.....11,058- 19-194-A- -

Guantanamo Bay

KG4AF.....13,130- 25-171-C- -

Mexico

XE2W.....28,428- 46-206-A- 8

Nicaragua

YN4CB.....16,713- 27-209-A- -

Panama

HP1BR.....6314- 22- 96-A-15

Virgin Islands

KV4BB.....176,880- 71-828-C-76

OCEANIA

Australia

VK4TN.....816- 8- 34-A-14
VK2JZ.....3- 1- 1-A- -

Hawaii

KH6MG.....72,270- 55-438-C-32
KH6PM.....34,830- 43-270-B-21
KH6LJ.....25,047- 33-253-C-14
KH6ER.....4524- 13-116-C- 5

New Zealand

ZL1MQ.....6561- 27- 81-A-13
ZL1HY.....3477- 19- 61-A- 6

SOUTH AMERICA

Argentina

LU1DDV.....21,252- 28-259-B-55

LU3PF.....6720- 14- 64-C- -
LU4DMG.....3360- 16- 71-B- -
LU5AR.....2640- 11- 80-B- -
LU2NC.....2412- 12- 67-A- -
LU9FAY*.....1302- 8- 58-A- -
LU9FP.....816- 8- 34-B- 2
LU9KE.....144- 6- 8-A- 2

Brazil

PY4VX.....9750- 25-130-A-20
PY4KL.....2310- 11- 70-B- -
PY4RJ.....2128- 14- 51-B- -
PY2AHS.....1680- 10- 54-C- 4
PY7GC.....48- 4- 4-B- -

British Guiana

VP3YG.....5992- 14-143-A-18
VP3HAG.....5068- 14-121-A-20

Chile

CE4BX*.....9178- 13-240-A-19
CE4AB.....696- 8- 29-B- -

Colombia

HK1FE.....1368- 9- 52-A- 6

Ecuador

HC2OL.....5796- 21- 92-B- 3

Neth. West Indies

PJ2AA.....22,194- 27-274-B-23

Peru

OA4V.....8848- 16-165-B-14

Uruguay

CX3BT*.....1232- 8- 52-A-16
CX7BA*.....756- 9- 28-A-15

Venezuela

YV5DE.....1368- 12- 37-A-10

[1] W3BES, opr.
[2] W2VGQ, opr.
[3] W6VUW, opr.
[4] W5LPG, opr.
[5] W5IZN, opr.
[6] W0SZU, opr.
[7] DL4BM, opr.

SAFETY CODE FOR SAFETY FIRST

The fall and winter months, busy operating months, may lead some amateurs to become careless in safety habits. To help prevent carelessness that can lead to tragic accidents, ARRL announces the continued availability of the ARRL Safety Code. In convenient wall-poster style, the Safety Code catalogs cartoon-illustrated safety rules for the amateur radio operator as well as full safety rules for equipment design and construction. It is available to you upon request, by card or radiogram, to the Communications Department.

NEW TRAINING FILM

A vital part of every amateur's safety knowledge is artificial respiration. Newer, easier and more effective methods of resuscitation are demonstrated in a new film just added to the League's Training-Aid film library. Available to *affiliated clubs* upon proper booking, the film's explanation and illustration of the Hoger-Nielsen and Emerson methods should be a *must* for safety programs. Request your *affiliated club* program chairman to write for booking information directly to Training Aids, Communications, ARRL. Be safety-conscious, and follow the Safety Code for safety first!

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FAST SERVICE: You get fast service. I have big stocks of Collins, National, Hallicrafters, Hammarlund, RME, Johnson, Harvey-Wells, Lysco, Gonset, Millen, Morrow, Mallard, Elmac, Master Mobile, Hy-Lite, Babcock, other receivers, transmitters, parts at lowest prices. I try to be the first to have the newest equipment.

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. . . In the editorial, ARRL offers a reward for information leading to the arrest and conviction of perpetrators of the Rockford–Sweden flight distress-signal hoax.

. . . Effective January 1, 1929, amateurs will make use of the new Q Code presented in entirety this issue as specified by the Washington Convention.

. . . Federal Radio Commission authorizes the frequencies 1715–2000 kc. and 56,000–60,000 kc. for use by amateurs in the transmission of television signals.

. . . In "High-Angle Radiation," Paul S. Hendricks gives an interesting report on 28,000-kc. beam antenna tests performed at E. C. Crossett's 1CCZ on Cape Cod.

. . . Associate Technical Editor Ross A. Hull tackles "The Frequency Measurement Problem" and details applications of the monitor in signal checking.

. . . "Getting Started on 160 Meters" is simple if you follow Technical Editor Harold P. Westman's hints in the building of gear for our lowest-frequency band.

. . . In "What Length Antenna?" James J. Lamb of ARRL's Technical Information Service discusses curious variations in fundamental-frequency Zepp dimensions.

. . . V. D. Landon thoroughly treats "Receiver Characteristics and Their Measurements," touching upon sensitivity, selectivity, fidelity and stability.

. . . "A Superheterodyne for High Frequencies" is described by E. J. Gluck, 4CQ-4AGE, a set using three triodes and one of the new screen-grid tubes.

. . . D. J. Angus, 9CYQ, tells of "A Portable Crystal-Controlled Transmitter" that employs three Type UX-210 tubes on the 3500- and 7000-kc. bands.

. . . "Picking the Right Filter Condenser" isn't as easy as it may seem, and Bert E. Smith stresses theoretical considerations involved when making a proper selection.

. . . Norman E. Woldman depicts specific applications of "The Duriron-Duralumin Electrolytic Rectifier," a unit formed of the new copper-aluminum alloy, duralumin.

. . . Navy Day, 28-Mc. DX, and late word from expedition stations WNP, VOQ and WSBS are among subjects covered in Communications Department pages.

Answer to **QUIST QUIZ** *on page 52*

While it's a true answer, it isn't necessarily adequate. In the first place, the Hothman system gives a *controlled-carrier* signal, and a receiver S-meter will try to follow the carrier variations. The tuning difficulties may be nothing more than the receiving operator's inability to recognize a controlled-carrier signal and to realize that it can't be tuned in by watching the S-meter in the usual manner.

However, if **A**'s oscillator is sensitive to voltage variations, it is possible that his transmitter frequency varies with speech syllables, since a controlled-carrier system puts a widely-varying load on the plate power supply. **A** can have this point checked by getting **B** to listen to the carrier with a receiver set up for c.w. reception — changes in carrier frequency with modulation will show up readily, although the receiver must be handled carefully to avoid overloading.

If only a few operators report the signal hard to tune, it can indicate that the majority of amateurs aren't fussy or critical, or that a few have poor receivers in which the a.v.c. action drags the high-frequency oscillator and detunes the receiver. But **A** can't be sure until he has checked his transmitter as outlined above.

BALUN COILS!

B&W BALUN INDUCTORS
Type 3975 — New low price $3.75 each coil

These sturdily-built air-wound coils can be connected to match 75 ohm unbalanced transmitter outputs to 75 and 300 ohm balanced antenna feed lines.

These bifilar balun inductors are specially designed for use with Collins 32-V series and similar transmitters—see "The Impedance Matcher" as described in CQ Magazine for May 1951. Two coils mounted on an 8" square plate serve as a compact, highly efficient all-band (80-10 meters) unit for matching feed line systems to both transmitters and receivers. Full instructions included with each inductor.

METAL BASE PLATE AND CONNECTORS NOT SUPPLIED.

B&W BARKER & WILLIAMSON, Inc.
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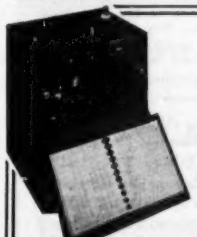

LOOK HERE, FELLOWS!

We will gladly pay the highest possible price for the purchase of any Heterodyne Frequency Meter as illustrated here, including the BC-221, the TS-173, the TS-174, the TS-175, and the TS-323.

Please write, giving complete information on nomenclature and condition to

WESTON LABORATORIES, Inc.
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QUADRAPOLE
2 MTR ANTENNA

Designed by W2NGA — an omni-directional HI-GAIN Vertical Array

- **2 MQ—P** $7.95
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  3 EL. 15 MTR/T-MATCH
- **2 E 20T** $47.95
  2 EL. 20 MTR/T-MATCH
- **6 E 10-20T** $98.95
  3 EL. 10 MTR/3 EL. 20 MTR STACKED/2 T-MATCHES

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U. S. N. R.

Conventions

The Navy was well represented during the Seventh ARRL National Convention on July 10–12, 1953, at the Hotel Shamrock, Houston, Texas. Cmdr. R. E. Coleman, USNR, W1NK, represented the Director, Naval Communications, Cmdr. Carlos M. Cordeza, USNR, represented the Commandant, Eighth Naval District.

Messages of greetings from the Director, Naval Communications, and the Commandant, Eighth Naval District, were delivered to the conventioneers. The Naval Reserve Training Center, Houston, K5NRH/5, operated a radioteletypewriter station and accepted messages for transmission via amateur radio. Naval Reserve operators at K5NRH/5 were W5NMY, W5WYR, W5WYT, and W5WYU. The District Reserve Master Control Station, New Orleans, W5U8N, Naval Reserve Training Center, Little Rock, K5NRL, and Naval Reserve Training Center, Shreveport, K5NRS, assisted in handling traffic.

Other naval personnel attending the convention were Capt. John N. Boland, USN (Ret.), W4CC; Capt. J. L. Reinarts, USNR, W6BJ; Cmdr. T. C. Pipes, USNR, W5PLQ; Cmdr. E. S. Drake, USNR, W4ESK; Ethel Mae Smith, RMN3, USNR, W3MSU.

The Naval Reserve Training Center, Denver, Colo., KØNRC, furnished a radioteletypewriter installation at the ARRL Rocky Mountain Division Convention at Estes Park, Colo., on June 20–21, 1953. Lt. R. J. Ferree, USNR, represented the Commandant, Ninth Naval District. Capt. G. R. Glanscock, USNR, assisted in operating the station.

Unit Winners

The following activities have been designated as the outstanding Naval Reserve electronics units of their respective types in the districts listed below:

Eighth Naval District: Electronics Division 8–21, Brownwood, Tex., (K5NCA); Electronics Company 8–57, Ruston, La., (K5NBD); and Electronics Platoon 8–50, Clarksville, Ark., (K5NCR).

Thirteenth Naval District: Electronics Division 13–1, Helena, Mont.; Electronics Company 13–4, McMinnville, Ore., (K7NAX); Electronics Pln., 13–4, Shelton, Wash.

ARRL Field Day

Naval Reserve activities of the Eighth Naval District took a very active part in the annual ARRL Field Day in June. In some locations, operations were combined with local amateur clubs. Participating stations were:

Call	*Activity-Location*	*Points*
W5USN/5	District Reserve Master Control Station, New Orleans, La.	1230
K5NAZ/5	Training Center, Lubbock, Tex.	693
K5NBW/5	Training Center, Beaumont, Tex.	2072
K5NRE/5	Training Center, El Paso, Tex.	261
K5NRS/5	Training Center, Shreveport, La.	2581
K5U8N/5	Training Center, Austin, Tex.	93
W5ANR/5	Training Center, Fort Smith, Ark.	2340
W5EGX/5	Training Center, Abilene, Tex.	12
W5ULY/5	Electronics Facility, Sherman, Tex.	—

Strays

The Texas State Fair, Dallas, will feature Radio Amateur Day on October 11th. There will be a demonstration on TVI, various special events, and prominent speakers will be on hand. No admission fee is required beyond the regular Fair admission; plenty of parking space will be available. For other details contact James R. Bonnell, W5PAC, President, Dallas Amateur Radio Club.

M. A. R. S.

A survey of MARS capabilities, including personnel, is being jointly planned by the Chiefs, MARS, in order to determine those civilian members who will be qualified and willing to participate in the MARS communications support mission during periods of national emergency.

The MARS advisory subcommittee appointed to study the use of MARS facilities as a military communications asset in support of civil defense has held numerous meetings at the Pentagon in Washington. From this working group came the suggestions which were formally adopted by the Departments of the Army and Air Force as a policy guide for military commanders in providing guidance relative to civil defense planning. This "statement of intent" provides that within the current availability of personnel and equipment MARS may:

(a) Make available communications services between the military forces in support of civil defense and the civil defense agencies.

(b) Make available communications services for civil defense forces on a temporary or emergency basis when such services are not otherwise available.

(c) Make available radio terminal facilities at designated military installations for civil defense tie-in as required.

(d) Make these services available on military frequencies assigned to MARS networks.

The Chiefs, MARS, wish to emphasize that MARS will not enter into competition with any other communication service. Amateurs (individuals and organizations) operating under the RACES program should be the primary source of communication, outside the commercial and civil-owned facilities. Where military communications support is required over and above these systems, MARS may prove to be of considerable value, both to the civil defense authorities and to the military commanders upon whom the request is made.

Members of the MARS Advisory subcommittee:

Chairman — Major Robert A. Wood (USAF), Office, Secretary of Defense.

Members — Major James A. Long, A3UWI, (Signal Corps), Chief, MARS (Army); Captain Walter S. Browne, jr., (USAF), Chief, MARS (Air Force); Mr. Francis E. Handy, W1BDI, American Radio Relay League; Mr. George K. Rollins, W3GA, FCC; and Mr. Carl A. Jones, Federal Civil Defense Administration.

Strays

When Francis L. Duffy and daughter appeared on "The Big Payoff" network television program to win, among other prizes, a trip to Bermuda, it couldn't have happened to a more appropriate amateur. Mr. Duffy is W9TV.

YL News and Views

(*Continued from page 51*)

mine whether or not they want to go into the field for their life's work. Had I not obtained my amateur license years ago, I would not be at Tech today, for amateur radio allowed me to experiment and realize what I wanted to do professionally."

Hence, words from one who, although still very young, has realized how much amateur radio has done to build her life. It could do the same for countless others, too.

—•••—

OM G6LJ suggests "Hamette" as a substitute for "YL". We can recall another OM — W2KH to be exact — addressing a mixed group as "Fellow Hams and *Hamesses*." Comments?

Keeping Up with the Girls

The new editor of *YLRL Harmonics* will be W98JR, Bernice, and not as previously announced. W4CJR, Anita, heads the committee to revise the YLRL Constitution; and W1FTJ, Dot, is chairman of the YLRL nominating committee for next year's officers. This information all from President W1BCU. . . . K2DYO is Dottie Wickenhiser's new call. She was formerly W3JSH. . . . W7OTI, Doris, is now living in Anchorage, Alaska. . . . W7BBS is proud of her OM, W7JRU, who was chosen Oregon's Most Outstanding Amateur of 1953. Luryne is alternate N C of the Oregon Emergency Net. . . . W9FZO, Helen, paid W7HHH, Ben, a surprise visit. . . . W3QPJ, Kay, is slowly recovering from an illness which has bothered her since April. . . . W2NAI, Marge, is founder and manager of the new Second Regional 'Phone Net, which meets each morning at 10:00 A.M. EDST, 3980 kc. . . . Binghamton, N. Y., is the new QTH of W2BNC, Helen. . . . W1QJY, Olga, has moved to Lakewood, Calif. . . . W2JZX appeared on a second N. Y. C. TV show for the purpose of giving amateur radio some favorable publicity. This time 14-year-old KN2CLC, Barbara, and her brother, K2BWP, were on with Vi. . . . W5DRA, Teev, and her OM, W5BIW, edit and publish the monthly New Mexico news bulletin — *CQ–NM*. . . . W8SON, Carol, received a certificate from the Mayor of Orange, Texas, for the amateur service she rendered during a recent flood. . . . OM W6FJH, SCM for San Diego, reports that a good friend is now KN6BHL. "Guy" is the XYL of W6ZLV. . . . VE3DEA thought CN8MM, Alexandre, a "very good sport" to come back to Denny's "little peanut whistle" on 20 c.w., when the YL from French Morocco was on 20 'phone and pursued by many other stations. . . . Newly-licensed W1YYU, Fern, is the daughter of W1UET, Martha. . . . W4s TIE, UDQ and WTJ enjoyed a personal rag-chew with Meg Beneke, W2EHR, when she and her OM, Tex, visited Memphis. . . . VE3s AJR DEA DEX DGT and DLL attended the Collingwood, Ontario, hamfest.

Hints and Kinks

(*Continued from page 47*)

generator. A 0.01-μfd. condenser should then be connected between the output-lead side of the coil and the case of the generator. This method of noise suppression seems to be much more effective than does the system which employs only capacitance for filtering. — *Felix W. Mullings, W5BVF*

Strays

W1WPR learned from WØBUR that Bill *Collins*, W7*RME* uses a *National* receiver.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified columns, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals. Diamond Drill Carbon Co., 719 World Bldg., New York City.

MOTOROLA used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

SUBSCRIPTIONS. Radio publications. Latest Call Books, $3.00. Earl Mead, Huntley, Montana, W7LCM.

QSL's-SWL's Meade WØKXL, 1507 Central Avenue, Kansas City, Kans.

QSLS, SWLS. Samples, 10¢. C. Fritz, 1213 Briargate, Joliet, Ill.

WANTED: Cash or trade, fixed frequency receivers 28–42 Mc. W9VIY, Troy, Ill.

QSLS, SWLS. High quality. Reasonable prices. Free samples. Write to Bob Teachout, W1FSV, Box Q124, Rutland, Vermont.

WANTED: Marconi multiple tuner, coherer, spark coil, magnetic detector, etc.; DeForest responder, coherer and other early equipment; Marconigraphs, Modern Electrics; Electrical Experimenter and early Call Books and text books of wireless. Franklin Wingard, Rock Island, Illinois.

WANTED: All types of aircraft radios, receivers and transmitters. Absolutely top prices. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

WANTED: AN/ARC-1 or AN/ARC-3 or components. Write to J. Durrant, 5526 Parkland Court, Apt. 202, Washington, D. C.

QSL samples. Dime, refunded. Roy Gale, W1BD, Waterford, Conn.

QSLS-SWLS, as low as $1.50 per color. Samples dime. Stronberg, P.O. Box 151, Highland Station, Springfield, Mass.

QSLS "Brownie," W3CJI, 3110 Lehigh, Allentown, Penna. Samples 10¢; with catalogue, 25¢.

RTTY. An amateur teletype monthly bulletin, $1.80 per year, available from Southern California Radio Teletype Society, 3769 East Green Street, Pasadena 10, Calif.

TOP prices or better your best offer for RT18ARC1, ARC3, ART13 gear, also any other air or ground equipment. Air Ground Electronics, Box 226, Kearny, N. J.

WANTED: BC-348 radio receiver. Advise price and condition. Write to C. Porter, 2520 Forest Glen Road, Silver Spring, Md.

QSL's, SWL's. Fair prices for excellent quality cards. Eleven styles for you to choose from. Samples, 10¢. Almar Printing Service, 602 Barker Bldg., Omaha, Nebraska.

CODE Slow? Just the help you need in psychological aids booklet. Two dollars postpaid. Inquiries invited. Donald H. Rogers, 41 Fourth St., Fanwood, N. J.

SELL two 7" TV sets, $30.00 each first check. Have couple larger will sell or trade for ham gear. W4AP1, Spitz, 1420 So. Randolph, Arlington, Va.

ATTENTION Bargain hunters! Dozens of real trade-in values including Collins, Vikings, Nationals, Hallicrafters, Elmac, Gonset, RME, Morrow, Harvey-Wells. Write for free bargain bulletin. Complete stocks, all leading brands. We trade and sell on time. Burghardt Radio Supply, Watertown, South Dakota.

QSLS, SWLS. Ham specialty printing. Keelings, Valley City, No. Dakota.

FOR Sale: One Collins 75A1 receiver, like brand new, $275.00. One Viking I completely shielded and filtered, $235.00; one Viking VFO with neatly built-in NBFM, $45.00. C. W. Amundson, W9LCM, 1013 Seventh Ave., Worthington, Minn.

WANT *QST*s older than 1920. Have 200 copies from 1932 to 1953 at 25¢ each. WØMCX Jablonsky, 1022 No. Rock Hill Road, Rock Hill 19, Mo.

DELUXE QSLS. Petty, W2HAZ, 17 Southard, Trenton, N. J. Samples 10¢.

QSLS? QSLS? Super-Gloss? State-map? Rainbow-map? Cartoon? QSL samples, 25¢. Rus Sakkers, WØDED, Ham Print Shop 53 East 7th St., Holland, Mich.

ELECTRONIC Technicians. For permanent positions with Sandia Corporation. Armed Forces acquired radar or electronic experience desirable; trade school certificate with minimum five years experience. Versatility, capability and willingness to work most essential. Sandia Corporation, a subsidiary of the Western Electric Company, operates the Laboratory under contract with the Atomic Energy Commission in Albuquerque, New Mexico. Excellent working conditions and liberal employee benefits, including paid vacations, sickness benefits, group life insurance and a contributory retirement plan. No housing shortage in the Albuquerque area. For further information write to Section (72), General Employment Division, Sandia Corporation, Sandia Base, Albuquerque, New Mexico.

COLLINS 32V3, perfect condition, $625.00; 10TVH coil, $2.00; Triplett meter, Mod. 327, 0–200 ma., 0–500 Ma., $3.50 each; 2" DeJur microamp 0–500, $3.50; Weston 301 50–0–50 Ma., $3.00; Weston 741 0–50 amps, $6.00; three G-E GL691 25μfd vacuum capacitors 7500V, $2.00 each; Elmac VC12, $3.00; 1-82A indicator, Stancor P6124, 220V. to 110 V 1000 watts, $8.00; G-E 2.5 v at 10 A, 1000 v insulation trans., $2.00; new plate trans, 3500V or 4800V C.T. at 150 Ma., $9.00. All F.o.b. No. Plainfield, N. J. Joe Harms, W2JME, 225 Maple Ave., North Plainfield, N. J.

SPECIAL T2FD antenna spreaders with bridle hardware; Radio News 40–20–10M untuned antenna; 80–40–20M antenna/counterpoise system with tuner; 66 ft vertical with special mounting base; Command units and accessories; xmitters: "Parko" 40M, 3-stage xtal 80M, similar 80-40-20M, Bi-Push all-band xtal, integral power supply; 600W amplifier 80–40M coils; PP813 amp. set-up for PP809s with spares and 3-813s with 500W 80–40–20M coils if wish to reconvert to higher power; xtal/ECO bandswitching xmitter 80/40 40/20M final coils, power supplies, enclosed Bud rack; 240W bias supply; exciter 600V power supply; 4400/2200/1500VDC supply; Spares: 9-872As, 6-1616s, 28-1625s, 14-1620s, 2-1629s, 5-211s, 2-3C24/24Gs, 2-304TLs. Remit with offer for units wanted, F.o.b. Expanded list: 25¢ coin. W2RUT, Boulder Lodge, Fulton, N. Y.

SELL: BC-348-S, Meissner portable combination radio, disc recorder, Kenneth Hydeman, Box 426, Piqua, Ohio.

NC101X receiver wanted. State price and condition. W2N1V, Henderson, 305 Griggs Ave., Teaneck, N. J.

HARVEY-WELLS TBS-50A modified by Harvey-Wells for adequate audio, $100.00, also power supply 900 volts 200 mils with powerstat, $35.00. Claude Butt, W2DBI, 24 Cedar Drive, Farmingdale, L. I., N. Y.

TRADE: Pioneer Genemotor 5.6 VDC input @ 28 amp., 600 VDC output @ 150 mils and Stancor ST203A 10 meter xmitter. Good condx. for 1500–2000 VDC power supply parts 400–500 mils. Need xfmer, chokes, conds. Write D. M. Springsted, W2GRI, 837 Eastern Ave., Schenectady, N. Y.

DYNAMOTOR 12 & 24V output 500V/50 Ma., $6.95; Mobile whip antenna, 72", $2.89; 2500VDC/200 Ma. Kenyon transformer and bridge (4) 866A rectifiers and 3 filament transformers, special combination, $23.00; TAB sells and trades radio parts and cameras. Write for Bargain Tabogram. "TAB", 111 Liberty Street, New York, N. Y.

WE have four ARC5 units which have been converted and used in commercial service on 159.63 Mc/s. One is converted to 110 volts A.C., two for 6 volts D.C. and one for 28 volts D.C. All are complete with power supplies, modulators and accessories. All replies will be answered. Texas and Northern Railway Co., 915 Conmerce St., Dallas, Texas.

1KW TVI proof, all bands 80-10 meters, P-813 final, pair 813s mod. All in cabinet size 40 x 22-15. Metal cabinet, double mesh screen, VFO is Collins PTO with B&W exciter, built similar to Collins 310-B; also Collins 75A-2, Millen ant. matching unit P-104 Hi-Fi Williamson amplifier, complete station with extra throw-n in. First $800 check takes all. G. J. Migliori, W1ONZ, 622 Green End Ave., Middletown, Rhode Island.

WANTED: Back issues of CQ, Feb. to July and Dec. 1945; Jan., Feb. 1946. W. Vollkommer, W2HO, Mountain Rd., Monroe, N. Y.

FOR Sale: Globe King 400-B, 420 watt phone or c.w. xmitter. Practically new. With new B&W coils for 10–20–40–80. Total retail value is approximately $525.00. Make an offer. W. B. Anderson, W5ODG, 1519 W. Cherokee, Enid, Okla.

FOR Sale: $325.00 takes brand new Viking II and Viking VFO, less than two months old, all latest modifications. Guaranteed perfect. Send postcard for list of choice surplus. Am cleaning house. J. D. Ogle, W1LSS, R.F.D. #2, Simsbury, Conn.

SELL: National NHU receiver 13.4–62 Mc. with extra tubes and separate power supply, $175.00; Super Pro receiver, 540–20 Mc., $175.00; other items, all new, BC-645A, $15.00; MD7 plate modulator and dynamotor, $15.00; P.E.103 Dynamotor, $25.00; P.E.55 dynamotor, $25.00; BC 459A, $15.00; BC-654 transmitter and receiver, $50.00. Dr. P. Z. Haus, 25 Upland Dr., Chappaqua, N. Y.

CALL LETTERS: 25 cents a set. Dress up your rig, car, etc. For samples, write to Robert Connick, Nickson, P.O. Box 272, Cincinnati 1, Ohio.

VIKING II, Henry wired, with Johnson VFO, $310.00; SX-28, $99.00; BC-221 AK, like new, calibration charts, modulation, $69.00; Morrow converter 80 and 10 $19.00; PE-103, new, control box, cables, $25.00. John V. Juelson, K6AGA, 10223 Airport Station, Los Angeles 45, Calif. WA-0632.

NRI-RADIO-TV course, 100 lessons, $30.00. In excellent condition (1950). Bob Abernethy, W2PQV, 120 Frederick Ave., Babylon, L. I., N. Y.

WANTED: Bargains in transmitters, receivers, laboratory and test equipment, power supplies, miscellaneous gear and parts. What have you? Harold Schonwald, W5ZZ, 718 N. Broadway Oklahoma City, Okla.

AM in the market for a complete ham installation. What have you to sell? Bob Garrison, Box 216, Route 5, 5950 SW 97th Ave. South Miami, Fla.

THINKING S.S.B.? Excellent layaway buy. New surplus 72nd harmonic type FT241-A crystals in guaranteed correctly matched sets for all published s.s.b. circuits using 4, 6, or 8 crystals. Price 4 crystals, $3.00; 6, $4.00; 8, $5.00, all postpaid. Quantity discounts available. Orco Products, Box 51, Downey, Calif.

QSL's. We've printed a million! Hundreds of satisfied hams all over the world. VVS Print, 1704 Hale Ave., Ft. Wayne 6, Ind.

EQUIPMENT made to specifications. Write Kustom Electronix, Al Kanda, Box 912, Minneapolis, Minn.

10, 15 and 20 Meter beams, aluminum tubing, etc. Perforated aluminum sheet for shielding. Radcliff's, 1720 No. Countyline St., Fostoria, Ohio.

BUILDING something? Save 50% on parts. Order by mail. Send for list. Box 51, Newton 58, Mass.

FOR Sale: New BC-1267A with power supplies in export case, $75.00; 500 watt Navy battle announcing system with 14 tube speech amplifier and all power supplies, $50.00; RT19ARC4, $20.00; Wheatstone Bridge and galvanometer, $20; SX25 with speaker, $60.00; Army 50-ft collapsing field antenna, $20.00. Transmitter T-50M with power supply, $75.00. A. Ostrochovsky, Jr., W2UPV Rea Ave. Ext., Hawthorne, N. J.

VIKING I, 4D32, de-TVI kit, push-to-talk, sidetone oscillator, beautifully assembled, like-new, $265.00; Collins 75A-1, excellent condition, realigned, $250.00. Reason: active duty. W4ALR, 5805 15th St. No., Arlington 3, Va.

SELL complete mobile receiver and transmitter won at National Convention. Gonset Super Six converter, Motorola police cruiser receiver P-69-18; Motorola transmitter FMT-30-DMS-75, antenna microphone, cables, hardware, etc. All new. Make an offer. Bill Adams, W6ANN, 6405 Corsini Pl., San Pedro, Calif.

QSLS-SWLS, samples, 10¢. Malgo Press, 1937 Glendale Avenue, Toledo 14, Ohio.

SALE: Super Pro SP400SK speaker, like new, $225.00. C. H. Fitch, 3512 Farragut, Kensington, Maryland, W3ENS.

AM overseas. Sell 32V1 stored Brunswick, Maine. Cannot ship. Pick up to $275.00. Also new Channel 4 10-el TV Yagi, $12.00. Don Miller, W2MQB/CN8, VP1Ø, FPO, NYC NY.

DON'T Fail! Check yourself with a time-tested Surecheck Test. Novice, $1.50; General, $1.75; Amateur Extra, $2.00. Amateur Radio Supply, 1013 Seventh Avenue, Worthington, Minn.

FOR Sale: One Lysco 600 transmitter, very clean, $95.00; one 120-watt modulation transformer Stancor A3843, $8.00. William Johnson, W8VOK, 23812 Hollander Ave., Dearborn, Mich.

50 Kc. coils for your Super Q5er. Q 60 with 390$\mu\mu$f capacitor. Similar to coils used in amplifier described in the Mar. '53 *QST*. $1.00 each, six for $5.50. Bob Seymour, W9WJS, 567 Elm Grove Drive, Elgin, Ill.

32V1 shielded, filtered, all leads by-passed, etc. HRO60 complete; D104 mike, auxiliary equipment, coax, antenna tuner. Best offer over $750.00. C. Compton, 64 Dande, Bridgeport, Conn.

FOR Sale: Lettine Model 240 transmitter, 50 watts on all bands. Self-contained power supply, modulator, and xtal mike speech amplifier. In first-class condition, $50.00. M. Smith, W2NYL, 832 Belmont Ave., Brooklyn 8, N. Y. Phone AP-7-0760.

NOVICES! Am cleaning house. Transformers: 600V 300 Ma., 6.95; 400V 150 Ma. 5V, 2.5V, 5.95; 6.3V, 3A, 2.95; Chokes, 6H 200 Ma., 2.95; 10H 250 Ma. 4.25; 12-4H, 300 Ma., 6.95. Will send list tubes, meters, other gear. W2FDJ, Willsboro, N. Y.

FOR Sale: Custom-built 800 watt 813 PP final, used 10 hours, $950.00; Collins 32V2 completely de-TVI'd and 75A2, $800 or $1650 complete. W2RLX, 881 Cambridge Rd., Woodmere, L. I., N. Y. Franklin 4-4942.

COLLINS 32V2 for sale. Original packing, manual. Used but very little and is in excellent condition: $450.00. C. Atkinson, Jr., 2433 Stanmore, Houston 19, Texas.

SPRING wound Instructograph, 10 tapes and manuals, $15.00; Bud Codemaster, $8.00; Galvin, Policalarm 30 to 50 Mc radio, $25.00; 6 volt police siren & red flasher for CD, $20.00; Brush Soundmirror tape recorder complete wid BA106 mike, cost $229.00, sell $95.00, all in gud condx. Want: Lettine xmitter and Gonset Communicator. L. Blum, 2661 Dibblee Ave., Columbus 4, Ohio.

SALE: Hammarlund xmitter 420 modulator, 411 kits. Beat offer. C. M. Neil, LCDR, MC, USN. 244C, 4201 Mass. Ave. Washington 16, D. C.

QSLS! Interesting samples 10¢. Tooker Press, P. O. Box T, Lakehurst, N. J.

SWEEPSTAKES QSLS by W9AYH, Robinson, eliminate contest labor. Imprinted rig, rcvr, score, etc. gov't cards or Kromekot. Also regular QSLs as low as $1.07 per 100. Maps, cartoons, fluorescent, special Novice deal, fast delivery. Indicate regular or sweepstakes samples, 10¢ dozen. Robinson, W9AYH, 12811 Sacramento, Blue Island, Ill.

JOHNSON Viking II transmitters available in kit form at $279.50 of wired and tested for $319.95. Viking VFO's wired and tested, with tubes, for $34.95; we take other equipment in trade and offer terms if desired. Also have quite a variety of used equipment. Write for latest list to Carl, W1BFT, Evans Radio, Concord, N. H.

BARGAIN: 250 watt 'phone/c.w. transmitter in 6 ft. rack, other extras; $150.00. Collins 310C-2 exciter, $100.00; BC-348-R converted to 110, ANL, speaker: $60; 1550 volt 350 Ma. Supply, $43. Heathkit O-7 oscilloscope: $33. All guaranteed to be in excellent working order. Donald McNamara, WØEKM, 203 N Huber, Anamosa, Iowa.

WANTED: Collins 310B-1 B2, B3 or Lysco 600, 600S. W5JIJ. Haley, 5341 McCulloch, Houston, Texas.

FOR Sale: Viking I, factory-wired, de-TVI'd with Viking VFO. One year old, $275.00 complete. SX-71 eight months old, $150.00; Millen R9er, $18.00 or trade for BC696. Need high power final complete with power supply with or without modulator. L. Shipley, W8LXQ 9048 Ridgewood Dr., Cleveland 29, Ohio.

FOR Sale: Collins 30K-1 tranxmitter $1400.00. In excellent condx. W1NVB, LeBrun, 44 Wheatland St., Peabody, Mass.

GOING Abroad and selling out: De-TVI'd 300 watt PP 5514 Class B rack and panel, 80 thu 10 'phone/c.w. xmitter with accessories and RME-69 rcvr with VHF-152A. All for $250.00 or make offer. Rig on air and open for local inspection. Hugh Pettis, W7MVA/8, 1057 12th St., Grand Rapids 4, Mich.

COMPLETE 1 Kw. and 100 w. 'phone or c.w. xmitter, pp. 4-250A final, pair 4-250A modulator, full high and low level filter with clipping; 6 ft. sturdy cabinet matches 32V2 totally enclosed. Separate power supplies. 32V2 exciter, 75A1 receiver; TVI supression throughout. Prefer St. Louis or vicinity. First offer over $1500, plus shipping and crating charges. Carrie Jones, W9ILH, 606 E. 8th St., Alton Ill.

FOR Sale: Lysco 600 TVI-proof, with modulator, used very little, $100.00, John Meck transmitter, 60 watts, $100.00. H. Nelson, 3454 N. Octavia, Chicago 31, Ill.

S-40B, 22 months old, perfect condition, $69.00. All inquiries ans'd. Reid O. Martin, W4VDY, P. O. Box 1023, Tavares, Florida.

SALE: Modulator-speech amplifier-power supply. Push-pull 807; 75 watts audio; suitable for rack-mounting. Weight 40 lbs., $25.00. W5NUN, Tucumcari, N. M.

FOR Sale: AC-DC 'phone/c.w. transmitter (3 watts), cheap receiver, television set, many transmitting and receiving tubes and parts; back issues radio magazines. List available. W8CBS, Austin, 743 Erie Ave., Chillicothe, Ohio.

FOR Sale: Entire kilowatt station. All in tip top condition with manuals, Meissner signal shifter (T 10-1207) with turret coils, all bands; Meissner phase modulator (FMX); Turner mike, 33D; kilowatt power amplifier (813's); Thordarson throughout with grid screen plate and R. F. meters and sep. supplies; panel mounted on 7' rack remotely operated; RME DB 22A HF amplifier and preselector; HQ-129X, Hallicrafters HT-7 frequency standard; xtals, speaker, sundry other gear. Best offer over $450.00. W2NWZ, J. Dickie, 75 Pleasant Ave., White Plains, N. Y.

QSL'S, high quality, fair prices. Samples? W7GPP, R. D. Dawson, 1308 F Street, The Dalles, Oregon.

TRADE Or sell: Complete darkroom outfit with federal enlarger. What have you? Allan Clarke, Union, Miss.

COLLINS 75A2 receiver, speaker and manual. Just back from factory for calibration, etc. Less than 50 hours total use. Best offer over $325.00. Don Spaan, WØGVP, 310 Golfview Ave., Iowa City, Iowa.

SELL QSTS: 1936 through 1946, except 1941; CQ 1949, '50, '51, '52, $25.00 or best offer. Also Gamewell mobile transmitter, $30.00 or best offer. Will not ship. W1JUL.

COLLINS 75A1, one of the last built, perfect, with 1031A 3" Panadaptor factory-converted for above receiver. All connected, ready to operate. Express prepaid, U. S. A., $385.00. WØJRQ, Mace Warner, 534 16th St., Denver, Colo.

FOR Sale: Complete Collins station, 32V3, 75A2 speaker, original boxes and instruction manuals. NBFM and crystal cal., spare 4D32 (new). Push to talk stand, BV mike, coax relay, Eldico tuner (new, factory-wired), coils 80,40,20,10. Beautiful station, less than 10 hours on the rig. Reason for selling: I have another complete station. Cash: $1100.00. F.o.b. Austin, Texas. You won't be sorry. Write W5TIK, A. W. Kendall, 1111 W. 6th St., Austin, Texas.

W2OFJ is closing the shack. Collins 32V2 and 75A-1, $750.00; everything to make 1 Kw station, pwr. supply with 6200v, Amertran, 872's and Variac, $90.00; modulation and input transformers for pair 100TH and TLs. Offers? 4-element 10 meter, over 3-element 20 meter Hy-Lite type construction, $50.00; prop-pitch motor and Selsyn and accommodating 30 ft. steel tower with indicator and 100 ft. control cable, $75.00. Also Mobile Elmac A54H, $120.00; Gonset Tri-band, $25.00; PE-103, $25.00. Bill Hoverman, 1807 Central Ave., Albany 5, N. Y.

NATIONAL HFS complete with 5886 AC power supply, $110.00; Harvey-Wells Bandmaster DeLuxe, Harvey-Wells VFO, APS-50 power supply, and DPS-50 6 volt dynamotor, all for $175.00. All excellent or unused. Davis, W8LOL, 119 W. Stanton Ave., Worthington, Ohio.

REAL Bargains: New and reconditioned Collins, Hallicrafters, National, Hammarlund, Johnson, Gonset, Elmac, Babcock, Harvey-Wells, Morrow, RME, Millen, Lysco, others. Reconditioned S38, $29.00, S40A, $69.00, S36A, $99.00, S76, $119.00; SX71, $149.00; SX42, $179.00; SW54, $35.00; NC125, $129.00, NC173, $149.00; NC183, $199.00; HRO50T, $249.00; VH152, $39.00; VHF152A, $49.00; RME45, $89.00; Lysco 600, $79.00; Meissner bandswitching VFO, $49.00; Collins 75A1, late model, $259.00; 75A2, $329.00; 32V1, $395.00; 32V2, $495.00; NC183D, HRO50T1, HRO60, HQ129X, Viking I, HT9, many others. Shipped on approval. Terms financed by us. Write for list. Henry Radio, Butler, Mo.

VARIABLE Speed attachment for your bug key! Combination lever and clutch attachment to fit any bug key; allows the operator to change to any speed within and beyond the range of his key instantly merely by moving the lever. Hams now using them say they wouldn't be without it. Excellent for traffic and all c.w. work. Chrome plated. Give make and model of key or size of hole in weight. Money back if not satisfied. Postpaid in U. S. Send $1.98 to J. A. Hills, 8165 Inwood Ave., Dayton 5, Ohio.

WANTED: ART-13, DY-17, BC-348, BC-312, BC-342, APN-9, APN-4, APR, ARC-1, ARC-3, BC-221, 32V-2, 75A-1, test equipment. Will trade for new ham equipment. Alltronics, Box 19, Boston 1, Mass. Richmond 2-0916.

FOR Sale: Used National HRO-50-T1, $295.00; Millen high voltage plate and filament supply, #90281, 700V. .235 amps. 6.3V 4 amps., $65.00; National HFS with all coils and supply, $75.00; Hallicrafters S-40, $95.00, like new. Used SX-42 complete with new speaker, $159.95; used Eldico TR-75 transmitter ready to operate, $45.00 each; new TR-75 kits, $55.00 each, only two left. Write us your needs. Ack Radio Supply Co., 2205 3rd Ave., N. Birmingham, Ala.

FOR Sale: NC57 receiver with S meter, perfect condition, $75.00. W9LQI, Ashton, Ill.

NYC-LI HAMFEST! October 9th, Lost Battalion Hall, Queens. Have a big time meeting the gang! Tickets $2.00 in advance, $2.50 at the door. Contact Julian Jablin, W2QPQ, Secretary, FLIRC, 147-14 Charter Road, Jamaica, L. I., N. Y.

BARGAINS! Extra special: Motorola P-69-12 mobile recvrs, $19.50; 32V1, $395.00; Globe King, $299.00; HT-9, $199.00; Supreme AF100 or Temco 75GA, $225.00; HRO-50, $275.00; 75A1, $250.00; SX-71, $169 00; S-76, $139.00; SX-43, $129.00; SX-45, $129.09; HRO Sr., $99.00; RME-2-11, $99.50; RME-45, $99.00; EX Shifter, $69.00; S-40A or SX-16, $69.50; VHF-152, $49.00; HF 10-20, $59.00; Globe Trotter, $69.50; MB611 mobile transmitters, $14.95; 90800 exciter, $22.50; DM-36-10 meter converter, $19.50, XE-10, $14.95; Gonset 10-11 converter, $14.95; and many others. We need used receivers: we give highest allowances for S20R, S-40A, B; NC-57; NC-100; NC-125; SX-24; SX-25; HQ-129X and similar receivers. Free trial. Terms financed by Leo, WØGFQ. Write for catalog and best deal to World Radio Laboratories, Inc., Council Bluffs, Iowa.

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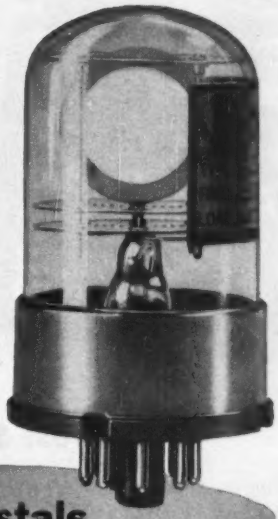

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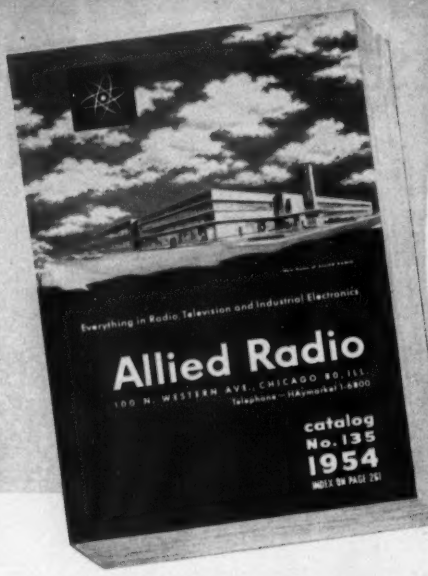

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COVERAGE: Continuous from 540 kcs. to 31 mcs. plus 48 to 56 mcs. for 6-meter reception.

FEATURES: Two tuned R.F. stages. 3 stages of I.F. Voltage regulated osc. and BFO. Main tuning dial covers range in five bands. Bandspread dial calibrated for amateur 80, 40, 20, 15, 11-10 and 6-meter bands. Bandspread usable over entire range. Six-position crystal filter. New-type noise limiter. High fidelity push-pull audio. Accessory socket for NFM adaptor or other unit, such as crystal calibrator.

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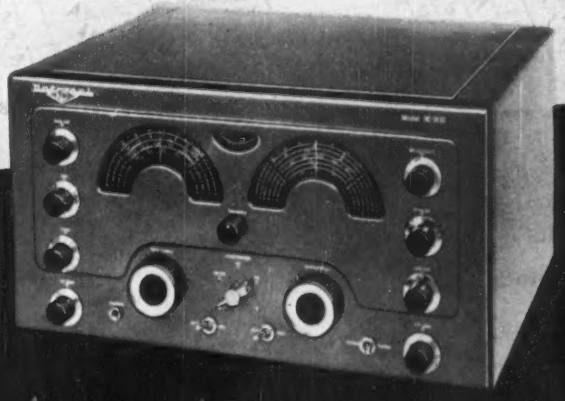

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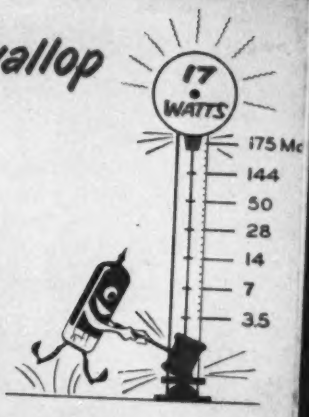

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